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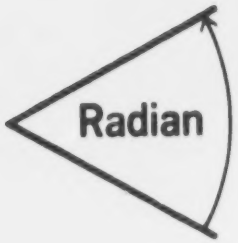

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16. Abstracts
The results of an emissions inventory for the state of Arkansas are reported. The following pollutants were considered in the inventory: Sulfur compounds, particulates, carbon monoxide, nitrogen oxides, and hydrocarbons and their derivatives. The data is presented for the seven Air Quality Control Regions in Arkansas. The data was accumulated in two categories; area sources and point sources. After the emissions were calculated, the point sources were located by their Universal Transverse Mercator System coordinates. The area source emissions were calculated from fuel combustion and solid waste disposal that was apportioned to that particular area. Finally, emissions for each Air Quality Control Region were summed from the area and point source calculations.

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Hydrocarbons
Fuels
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17b. Identifiers/Open-Ended Terms

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Air Quality Control Regions
Particulates

17c. COSATI Field/Group 13B

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FINAL REPORT FOR
FEDERAL CONTRACT OF
12 APRIL 1971 THROUGH 31 AUGUST 1971

STATEWIDE EMISSIONS INVENTORY FOR THE STATE OF ARKANSAS

To:

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ABSTRACT

Radian Corporation was contracted by the Environmental Protection Agency to provide technical and clerical assistance to the State of Arkansas in development of a statewide emissions inventory.

As part of this assistance, Radian worked with the staff of the Arkansas Pollution Control Commission (APCC) to define total emissions and sources of air pollution within the State. As contractors, Radian's responsibilities were to assist the APCC in development of a mailing list of potential point sources, collect fuel and refuse data as well as data to apportion area source emissions, calculate emissions, and prepare the data into a final report.

The purpose of the final report is to fulfill that part of Federal requirements for the preparation, adoption and submittal of an Implementation Plan.

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I. INTRODUCTION

The Clean Air Act provides for an intergovernmental system for the prevention and control of air pollution on a regional basis. The EPA Office of Air Programs is responsible for designating Air Quality Control Regions (AQCR) and issuing air quality criteria and reports on control techniques. State governments are then expected to establish air quality standards for the AQCR in their jurisdiction and adopt plans for the implementation of these standards.

One of the major elements required in the development of an implementation plan is a complete statewide emissions inventory. Radian Corporation is under contract to the Environmental Protection Agency to provide assistance to the State of Arkansas in development of such an emissions inventory. This report describes the work accomplished by the Arkansas Pollution Control Commission and Radian during the period 12 April 1971 through 1 September 1971.

When preparing the complete emissions inventory for the State of Arkansas, the following five pollutants were considered:

1. Sulfur Compounds (SO_2, SO_3)
2. Particulates
3. Carbon Monoxide
4. Nitrogen Oxides (NO_2 and NO)
5. Hydrocarbons and their derivatives.

The data is presented by Air Quality Control Regions. There are seven of these regions in Arkansas. A Universal Transverse Mercator grid system was used in locating the emission sources for the Little Rock-North Little Rock area.

Data was accumulated in two main categories: (1) Area sources and (2) Point sources. Area sources include the small polluters such as residential and commercial fuel combustion, on-site solid waste disposal, and transportation emissions. Point sources include the larger polluters such as manufacturing establishments.

A mailing list for possible point sources was compiled using: (1) a manufacturing directory, (2) a list of cotton gins, and (3) a list of wood products establishments.

After the emissions were calculated, the point sources were located by their Universal Transverse Mercator System coordinates.

The area source emissions were calculated from fuel combustion and solid waste disposal data that was apportioned to that particular area. The techniques used for apportioning this data are described in the Methodology Section of this report.

Finally, emissions for each Air Quality Control Region were summed from the area and point source calculations.

II. AREA DESCRIPTION

The emissions inventory was conducted throughout the State of Arkansas. The entire State, with the exception of a portion of Mississippi County, lies within Zone 15 of the Universal Transverse Mercator grid. The coordinates for the small portion of Mississippi County that lies in Zone 16 were projected to be in Zone 15 to facilitate point and area source location. Map A of this report presents the UTM grid system used for the State of Arkansas to uniquely locate point and area sources.

The EPA Office of Air Programs is responsible for designating Air Quality Control Regions (AQCR) and political jurisdictions within an AQCR. Air quality criteria and reports on control techniques are issued for specific AQCR. Map B of this report presents the seven uniquely numbered AQCR containing the State of Arkansas and the uniquely numbered political jurisdictions within each AQCR.

A grid system for the Little Rock-North Little Rock area within the Central Arkansas Intrastate Air Quality Control Region (16) is presented on Map C of this report. This grid system is within Pulaski County, which is political jurisdiction 16 of AQCR 16. The smaller grids (6.25 Km^2 and 25 Km^2) cover the area of high air pollution potential. The larger grids (100 Km^2) show rural areas of low pollution, other than possible larger individual sources.

III. DESCRIPTION OF TASK

This section of the report describes in detail the steps taken to provide a complete statewide emissions inventory for the State of Arkansas.

A. Review of Available Data

All of the registration forms on file with the Arkansas Pollution Control Commission (APCC) as of 26 April 1971 were reviewed for content and completeness. This amounted to some 1200 forms including those from cotton gins. A set of 631 forms from various companies as well as forms from 337 cotton gins were considered adequate. These forms were taken to Austin, xeroxed, and returned to APCC in Little Rock. This type of registration form transfer was carried on throughout the project enabling Radian to compile a complete duplicate file of registration forms for the State. In this manner, most problems arising from data on the forms were resolved by telephone.

B. Development of Mailing List and Questionnaire Mail-Out

1. Development of Mailing List

A mailing list was prepared from the following sources: the reviewed forms on file at APCC, the Arkansas Industrial Directory[1], an Association of Cotton Ginners Directory[2], and a list of wood products industries compiled by the staff of the APCC. A total of 1,623 general and wood products industries as well as 120 cotton gins were included in the mailing list.

2. Questionnaire Mail-Out

For the State of Arkansas, the questionnaires mailed were blank registration forms as had previously been used by the APCC. Three types of forms (for general or wood products industries, and cotton gins) were used. Cover letters for companies in each of these categories were prepared by the APCC. For each type of company, two different cover letters were prepared. One cover letter was directed to new contacts by the APCC, the other toward companies which had incomplete or missing registration forms.

A computerized data base for the Arkansas Emissions Inventory was compiled from the mailing list and from the 968 registration forms originally received. This data base was used to maintain a status list for all industries in contact with the Arkansas Pollution Control Commission. Substantial use of this data base enabled Radian to maintain an up-to-date account of returned registration forms. An example of the type of information extracted from the data base and used during the emissions inventory work is given in Appendix III.

As of 28 July 1971 (cut-off date for point source data collection) 2,558 companies had been contacted by APCC for the emissions inventory. Of these, 1,130 companies had complete registration forms and were considered qualified point sources. In addition, the following information was compiled.

a. 14 companies had incomplete forms.

b. 127 companies were out of business.

c. 924 companies were negligible.

d. 363 companies either failed to return the registration forms or were non-existent according to the U.S. Post Office.

C. Data Collection to Calculate and Apportion Area Source Emissions

1. Fuel-Use Totals for Arkansas and Smaller Political Jurisdictions

Total figures for natural gas, distillate and residual oil consumption by category for the State of Arkansas were obtained from Mineral Industry Surveys[3] by the U.S. Bureau of Mines.

Local fuel dealers were contacted in several areas of the State and it was determined that distillate and residual oil consumption was insufficient to warrant collecting detailed fuel-use totals for apportioning.

Natural gas consumption in Arkansas warranted contacting all the major distributors to aid in apportioning state totals. The following gas companies were contacted:

a. Arkansas Louisiana Gas Company
b. Arkansas Oklahoma Gas Company
c. Arkansas-Missouri Power Company
d. Arkansas Western Gas Company
e. Louisiana-Nevada Transit Company
f. The Union Gas Company of Arkansas
g. Mansfield Gas, Incorporated

Sufficient data was received to allow apportioning state totals down to municipality level in most cases.

2. Refuse Totals

Information on refuse totals and disposal methods was sparse. The APCC Solid Waste Section was contacted to assist in gathering necessary data. Sufficient data from 43 communities in Arkansas was available on total refuse generated and the approximate amount disposed of by the various methods.

The Arkansas Pollution Control Commission agreed to the development of state refuse totals and emissions from refuse disposal on the following basis. Open-burning was being done to some extent at most dumping grounds. Communities with populations greater than 2,000 generally had a community disposal site or sites. Refuse totals were developed on a per capita basis (see Methodology Section) and assigned to a site or distributed equally among multiple sites. These totals were compared to available data from the 43 communities and agreed favorably. These disposal sites were then pinpointed on county maps and finally sited on the UTM grid system and considered as point sources.

3. Data Collected to Calculate Area Emissions by Source Category

a. Residential fuel use. 1970 Census Data for Arkansas was obtained from the U.S. Department of Commerce[4,5]. Additional information on breakdown of households using various fuels and census tract data were obtained from METROPLAN in Little Rock, Arkansas.

b. Commercial, Governmental and Industrial fuel use. Employment information was obtained from the 1967 Census of Manufacturers[6] for Arkansas. Land-use maps and information were obtained from METROPLAN in Little Rock, Arkansas.

c. Vehicle Emissions. State totals for vehicle-miles and vehicle count data for Little Rock-North Little Rock were obtained from the Arkansas State Highway Department[7].

d. Other Mobile Source Data.

(1) Aircraft. Information was requested and received from seven major airports in Arkansas. The information included total number of operations (takeoff and landing) and types of aircraft involved.

(2) Waterborne Vessels. Data on total ton-miles of vessel traffic was obtained from Waterborne Commerce of the U.S.[8].

(3) Railroads. Data on total track miles was obtained using U.S. Geological Survey maps of Arkansas.

D. Contacting of Non-Respondents

On 1 June 1971, the status book of companies in contact with the APCC was reviewed to determine a priority list for recontact by the state with the assistance of Radian. From 2 June 1971 through 14 June 1971 approximately 250 nonrespondents had been contacted by telephone. Of this group approximately 30 qualified point sources contact had not received or had discarded the original registration forms. New forms were mailed to these companies. As of 28 July 1971, a total of 376 companies had been contacted by APCC and/or Radian by telephone and 19 by letter.

E. Determination of Little Rock-North Little Rock Grid System

The Little Rock-North Little Rock Metropolitan Area was the only area in Arkansas that was gridded for possible diffusion modeling work. The area was gridded using grid sizes of 2.5, 5, and 10 Km on a side. Placement of the grid was

determined by population density, land-use maps and topographical considerations. Map C of this report presents the grid system as well as a point source reference for the gridded area.

F. Calculation of Point Source Emissions, Actual and Allowable

Calculation of point source emissions for 1,272 point sources in the state of Arkansas was performed either by hand at Radian or by using the Point Source Program provided by the Office of Air Programs (OAP). The hand-calculated emissions are based on the Air Pollutant Emissions Inventory Techniques[9] (APEIT) manual, the Emissions Factors[10] manual, and on instructions from OAP on recording the point source emissions on forms provided by them.

A criteria of 3 to 5 tons/year of particulate matter and 10 tons/year of any of the pollutants was used to determine the qualification of an emissions source as a point source. This criteria was used unless the source was included in the list of major sources presented in Appendix I. Any company whose nature of business was included in this list were considered as qualified point sources regardless of size.

Allowable emissions based upon Arkansas regulations[11] and emissions based upon information contained within the Model Regulation portion of the Guidelines of the Federal Register[12] were also calculated and recorded on OAP forms. Two copies of the point source emissions for the state of Arkansas are on file with OAP, the Regional Project Officer, and the APCC.

G. Calculation of Area Source Emissions

Calculation of area source emission for the seven AQCR and the gridded LR-NLR area was performed either by hand at Radian or by using the Area Source Program provided by the Office of Air Programs (OAP). These emissions are reported by county within each AQCR and by grid in the LR-NLR area. The techniques used for area source emissions calculation were derived from the same manuals as used in point source calculations. Two copies of the area source emissions for the state of Arkansas are on file with OAP, the Regional Project Officer, and the APCC.

H. Print-Out and Review of Point and Area Source Data

Radian had all the data for point and area source calculations keypunched and run through the programs previously mentioned. The output was reviewed by OAP, the Project Officer, and APCC. The data for the point source emissions was slightly revised and another run of the OAP Point Source Program was made for the final report. Appendix II contains the summary (pie charts and tables) by source category for each AQCR which was derived from the point and area source emissions output.

IV. METHODOLOGY BY SOURCE CATEGORY

A. Fuel Combustion

1. Natural Gas

Total figures for natural gas consumption by category in Arkansas for 1969 were obtained from Mineral Industry Surveys[3] by the U.S. Bureau of Mines. Also the percentage increases over 1968 were given. From this data total figures for 1970 were calculated. Next, natural gas consumption data by summarized county was obtained from the gas companies in Arkansas and added up to give regional totals. The remaining amounts were apportioned by county and added to the regional totals. The domestic natural gas used was apportioned using the number of dwelling units in each county or grid. The commercial and industrial natural gas was apportioned using population, land-use maps of the grid system, (Little Rock-North Little Rock, Arkansas) and number of manufacturing employees.

Example:

For Benton County in Arkansas:

1. population = 50,476
2. mfg. employees = 10,950
3. dwelling units = 18,667

For State of Arkansas:

1. mfg. employees = 221,254
2. dwelling units = 671,261
3. population = 1,923,295

4. 1969 total residential natural gas used
   = 58,322,000 MCF

5. % increase over 1968 (res.) = 6.2

6. 1969 total commercial natural gas used
   = 37,857,000 MCF

7. % increase over 1968 (comm.) = 8.5

8. 1969 total industrial natural gas used
   = 233,082,000 MCF

9. % increase over 1968 (ind.) = 18.2

Therefore,

1970 Residential Natural Gas Usage for the State
= 58,322,000 x 1.062 = 61,937,964 MCF.

1970 Commercial Natural Gas Usage for the State
= 37,857,000 x 1.085 = 41,074,845 MCF.

1970 Industrial Natural Gas Usage for the State
= 233,082,000 x 1.182 = 275,502,924 MCF.

For Region 017 (containing Benton County):

1. Total dwelling units = 82,444

2. Total manufacturing employees = 43,435

3. Total population = 232,770

4. 1970 residential natural gas usage:

Amount Accounted for by Gas Companies = 8,119 MMCF

State Total Minus Amount Accounted for = 0

Therefore,

Total Residential Natural Gas = 8,119 MMCF

5. 1970 commercial natural gas usage:

Amount Accounted for by Gas Companies = 6,096 MMCF

State Total Minus Amount Accounted for
= 41,075 - 35,844 = 5,231 MMCF

Apportioned Regional Total = 5,231

$$\times \frac{232,770}{1,923,295} = 633 \text{ MMCF}$$

Therefore,

Regional Total for Commercial Natural Gas
= 633 + 6,096 = 6,729 MMCF

6. 1970 industrial natural gas usage:

Amount Accounted for by Gas Companies in the Region = 7,804 MMCF

State Total Minus Amount Accounted for in the State = 275,548 - 264,683 = 10,865 MMCF

Apportioned Regional Total = 10,865

$\times \frac{43,435}{221,254}$ = 2,133 MMCF

Therefore,

Regional Total for Industrial Natural Gas

= 2,133 + 7,804 = 9,937 MMCF

County Total of Residential Natural Gas

$= \frac{18,667}{82,444} \times 8,119 = 1,838$ MMCF

County Total of Commercial Natural Gas

$= 6,729 \times \frac{50,476}{232,770} = 1,459$ MMCF

County Total of Industrial Natural Gas

$= 9,937 \times \frac{10,950}{43,435} = 2,505$ MMCF

Emission factors used are derived from Table 6, page 11 of Reference 10.

Natural Gas

(lb. per 10^6 cu.ft.)

	Part.	SO_2	CO	HC	NO_2
Industrial	18	0.6	0.4	40	120
Commercial	19	0.6	20.0	8	50
Domestic	19	0.6	20.0	8	100

For example:

NO_2 Emissions from Residential Natural Gas in Benton County = $100 \times 1,838 \times \frac{1}{2,000}$ = 91.9 tons

2. Distillate Oil and Residual Oil

Total figures for distillate and residual oil consumption by category in Arkansas were obtained from Mineral Industry Surveys[3] by the U.S. Bureau of Mines. The amount used by point sources was subtracted and the remaining amount was apportioned to the regions, counties, and grids. Domestic oil was apportioned using number of dwelling units. Commercial and industrial oil was apportioned using population, land-use maps of the grid system, and number of manufacturing employees.

Example:

For the State

Commercial Distillate Oil Use = 27,581,000 gal.

Non-pt. Source Industrial Distillate Oil Use
= 42,252,000 gal.

Total Manufacturing Employees = 221,254

Total Population = 1,923,295

Commercial Residual Oil Use = 45,403,000 gal.

Industrial Residual Oil Use = 5,710,000 gal.

For Region 017:

Total Manufacturing Employees = 43,435

Total Population = 232,770

Therefore,

Commercial Distillate Oil Use = 27,581,000
$\times \frac{232,770}{1,923,295}$ = 3,338,000 gal.

Industrial Distillate Oil Use = 42,252,000
$\times \frac{43,435}{221,254}$ = 8,293,000 gal.

Commercial Residual Oil Use = 45,403,000
$\times \frac{232,770}{1,923,295}$ = 5,495,000 gal.

Industrial Residual Oil Use = 5,710,000
$\times \frac{43,435}{221,254}$ = 1,121,000 gal.

For Benton County (in Region 017):

Total Manufacturing Employees = 10,950

Total Population = 50,476

Therefore,

Total Commercial Residual Oil = 5,495,000
$\times \frac{50,476}{232,770}$ = 1,192,000 gal.

Total Industrial Residual Oil = 1,121,000
$\times \frac{10,950}{43,435}$ = 283,000 gal.

Total Commercial Dist. Oil = 3,338,000
$\times \frac{50,476}{232,770}$ = 724,000 gal.

Total Industrial Dist. Oil = 8,293,000

$$\times \frac{10,950}{43,435} = 2,091,000 \text{ gal.}$$

Emission factors used are derived from Table 5, page 10 of Reference 10.

(lb. per 1000 gal.)

	Distillate	Residual
Particulate	15	23
SO_2	38	490
CO	0.2	0.2
HC	3	3
NO_2	60	60

For example:

Particulate Emissions for Benton County for Distillate Industrial Oil Use Are:

$$15 \times \frac{2,091,000}{1,000} \times \frac{\text{ton}}{2,000 \text{ lbs.}} = 15.7 \text{ tons}$$

B. Gasoline and Diesel Fuel Combustion

The total vehicle miles traveled by county was obtained from Arkansas Highway Department data[7]. Then, assuming the average gas mileage for vehicles was 12 mpg, the total gallons of gasoline consumed was calculated. From Duprey's Air Pollutant Emission Factors[10], the factor of 96 lbs. evaporated/1000 gallons was used to calculate the total number of gallons evaporated by county. Next, an average ratio of gasoline consumed to diesel consumed was computed and used to calculate the county

totals of diesel consumed. From 1970 Automobile Facts and Figures[13] by the Automobile Manufacturers Association, the figure of 8% was used to find the amount used in engines built in 1970 or later. The grid totals were obtained by apportioning the county total based on actual vehicle miles counted on traffic volume maps for 1970 prepared by the Arkansas State Highway Department.

Gasoline Evaporative Losses (derived from pp. 24, 40 of ref.10)

Filling service station tanks	9	lb/1000 gal.
Filling automobile tanks	12	
Evaporation from cars	75	
Total	96	lb/1000 gal.

In the states of Texas and Louisiana, diesel sales were 6.39% of gasoline sales. This figure was used to calculate the diesel fuel usage by county in Arkansas from the amount of gasoline used in each county.

Example 1:

For Benton County:

Total Vehicle Miles = 590,233 Vehicle miles/day

= 215,435,045 Vehicle miles/year

Total Gasoline Consumed = 215,435,045 Vehicle miles per year/12 miles per gal. = $17,952 \times 10^3$ gal./year

Total Gasoline Evaporated = 96 lbs/1,000 gal. $\times$ 17,952 $\times \frac{\text{ton}}{2,000}$ = 862 tons/year

Total Diesel Fuel Used = $17,952 \times 10^3$ gal. x .0639 (average factor) = $1,148 \times 10^3$ gal.

Example 2:

For Grid 1 Total Vehicle Miles = 74,657 Vehicle miles/day

For Entire Grid System, Total Vehicle Miles = 2,816,702 Vehicle miles/day

For Entire Grid System Gal. Gasoline Combusted = $58,479 \times 10^3$ gal.

For Grid 1:

Gal. Gasoline Consumed = $58,479 \times 10^3$ gal. $\times \frac{74,657}{2,816,702}$ = $1,550 \times 10^3$ gal.

Tons Gasoline Evaporated = 96 lbs./10^3 gal. x 1,550 x 10^3 gal. $\times \frac{\text{ton}}{2,000}$ lbs. =74 tons.

Gal. Diesel Consumed = 1,550 x .0639 = 99×10^3 gal.

Emission factors were derived from pp. 75, 81, 83, 85, and 88 of reference 9 as follows:

(lbs. per 1,000 gal. gasoline consumed)

Particulate (p. 75)	12
SO_2 (p. 81)	9
NO_x (p. 80)	113

CO	see below
HC	see below

CO

(1) % cars produced during and before 1968 = 82%

(2) % cars produced between 1968 and 1970 = 9%

(3) % cars produced during 1970 = 9%

} derived from p.18 of ref.13

emissions from (1) = 2300 lb/1,000 gal (p. 85)

emissions from (2) = 2300 - 0.5 (2300) = 1150 lb/1000 gal.

emissions from (3) = 2300 - 0.7 (2300) = 690 lb/1000 gal.

weighted average emissions =

2300 (0.82) + 1150 (.09) + 690 (.09) = 2052 lb/1000 gal.

HC

Exhaust

emissions from (1) = 200 lb/1000 gal.

emissions from (2) = 200 - 200 (0.7) = 60 lb/1000 gal.

emissions from (3) = 200 - 200 (0.8) = 40 lb/1000 gal.

weighted average emissions =

200 (.82) + 60 (.09) + 40 (.09) = 173 lb/1000 gal.

Crankcase

emissions from (1) = 128 lb/1000 gal.

emissions from (2),(3) = 0

weighted average emissions =
128 (0.82) = 105 lb/1000 gal.

Total HC emissions = 105 + 173 = 278 lb/1000 gal.

DIESEL

(lbs. per 1,000 gal. gasoline consumed)

Derived from Table 15, p. 28 of Reference 10:

	Before 1970	After 1970
Particulate	25	10
SO_2	45	45
CO	325	215
HC	65	25
NO_2	340	505

Example:

NO_x Emissions for Grid 1 are:

Gasoline:

$$\frac{113 \times 1550 \times 10^3}{1{,}000} \times \frac{\text{ton}}{2{,}000 \text{ lbs.}} = 87 \text{ tons}$$

Diesel:

$$\left[340 \times .92 \times 99 \times \frac{\text{ton}}{2000 \text{ lbs.}}\right] + \left[505 \times .08 \times 99 \times \frac{1}{2000}\right]$$

$$= 17 \text{ tons}$$

C. Solid Waste Disposal

A factor of 5 lbs/capita day of solid waste created was used to estimate the total amount of solid waste in a county or grid. This factor is presented in Air Pollutant Emission Inventory Techniques[9] by Philip J. Bierbaum and Marius J. Gedgaudas. Next, all burning dumps, sanitary landfills, etc., were located and estimates of refuse handled at each site were obtained. This refuse was subtracted from the estimate of total refuse generated in each county and grid. The remaining refuse was apportioned to domestic on-site open burning based on population densities in each county and grid.

Example:

Benton County:

Population = 50,476

Solid Waste Created = 50,476 x 5 lbs./capita day x 365 days/yr. x 1 ton/2000 lbs. = 46,049 tons/year

Dumps (all open burning):

Rogers: 3,952 tons/year
Siloom Springs: 9,506 tons/year
Bentonville City: 5,026 tons/year

Therefore,
On-Site Domestic Burning = 46,059 - (3,952 + 9,506 + 5,026) = 27,575 tons/year.

Emission factors used were derived from Table 13, page 22 of Reference 10. The factors are:

Particulate	16 lbs/ton burned
SO_2	1 lb./ton burned
CO	85 lbs/ton burned
HC	30 lbs/ton burned
NO_2	6 lbs/ton burned

For example:

Particulate Emissions = 16 lbs/ton x 27,575 tons/year x ton/2,000 lbs. = 221 tons/year.

D. Railroad Oil Use Apportionment

The total railroad oil use for the state of Arkansas is available from Mineral Industry Surveys[3] made by the U.S. Bureau of Mines. This total was apportioned to counties and grids using railroad track mileage measured from U.S. Geological Survey maps.

Example:

Railroad Oil use for State = 39,480,000 gal.

Total Miles Track Measured in State = 3,345.8 miles

Total Miles Track Measured in Benton County = 63.6 miles

Therefore,
Railroad Oil use for Benton County = $\frac{63.6}{3,345.8}$
x 39,480,000 = 750×10^3 gal.

Emission factors used were derived from page 38 of Reference 9. The factors are:

Particulate	25 lbs/1000 gal. consumed
SO_2	40 lbs/1000 gal. consumed
CO	60 lbs/1000 gal. consumed
HC	136 lbs/1000 gal. consumed
NO_2	222 lbs/1000 gal. consumed

For example:

Particulate Emissions = $\frac{25 \times 750}{2,000}$ = 9.37 tons

E. Vessel Oil Use Apportionment

The total vessel oil used for the state of Arkansas is available from Mineral Industry Surveys[3] made by the U.S. Bureau of Mines. This total was then apportioned by total ton-miles (available from Waterborne Commerce of the United States[8]) to the three main rivers in Arkansas: the Arkansas River, the White River and the Black River. Then the oil use for each

river was apportioned to county and grid use using the miles of river in each county or grid. The mileage of river was determined by direct measurements from U.S. Geological Survey maps.

Example:

Total Distillate Oil use (vessel) for Arkansas
= $1{,}260 \times 10^3$ gal.

Total Residual Vessel Oil use for Arkansas
= 126×10^3 gal.

Total ton-miles for Arkansas River	=	119,259,821
Total ton-miles for White River	=	164,100
Total ton-miles for Black River	=	121,700
Total		119,545,621

Total Distillate Oil use for Arkansas River

$$= \frac{119{,}259{,}821}{119{,}545{,}621} \times 1{,}260 \times 10^3 = 1{,}256{,}976 \text{ gal.}$$

Total Residual Oil for Arkansas River

$$= \frac{119{,}259{,}821}{119{,}545{,}621} \times 126 \times 10^3 = 125{,}698 \text{ gal.}$$

Obviously, the White and Black Rivers are negligible.

Emission factors used were derived from page 38 of Reference 9. The factors are:

	HC	CO	NO_2	SO_2	Particulate
Residual	2	2	72	495	23
Distillate	2	2	72	36	15

For Jefferson County:

Total Miles Arkansas River = 66.9 miles

Total Miles Arkansas River in State = 369 miles

Therefore,
Total Vessel Distillate Oil use in Jefferson County is
$\frac{66.9}{369}$ x 1,256,976 = 227,513 gal.

and

Total Vessel Residual Oil use in Jefferson County is
$\frac{66.9}{369}$ x 125,698 = 22,751 gal.

An example for use of emission factors follows:

NO_2 from Distillate Oil = $72 \times \frac{227,513}{1000} \times \frac{\text{ton}}{2,000 \text{ lbs.}}$
= 8 tons

NO_2 from Residual Oil = $72 \times \frac{22,751}{1,000} \times \frac{\text{ton}}{2,000 \text{ lbs.}}$
= .8 tons

Therefore,
Total NO_2 Emissions = 8.8 tons

F. Aircraft Emissions

Inquiries were sent out to major airports as to the number of landings and takeoffs and types of planes involved in the operations. The emission factors listed in Air Pollutant Emission Factors[10] by Duprey were used to calculate the emissions from planes.

Example:

In Little Rock, in Grid 5C3 there is one airport. Takeoffs and landings are as follows (1 operation = 1 takeoff and 1 landing):

Light piston 2 engines = 69 operations
Light piston 1 engine = 115 operations

Emission factors used were derived from Table 17, page 31 of Reference 10. The factors (lbs. per engine per operation) are:

Type Aircraft	Particulate	SO_2	CO	HC	NO_2
Turbofan					
Jumbo-jet	10	2	28	3	6
Long-range	8	2	26	17	5
Medium-range	7	2	16	50	7
Turbojet	11	2	24	25	5
Turboprop	6	1	2	3	5
Turboshaft	3	1	6	0.5	0.6
Piston					
Transport	5	2	303	40	0.4
Light	0.2	2	12	0.4	0.2

For example:

CO Emissions = [69 x 2 x 12 x ton/2000 lbs]
+ [115 x 12 x ton/2000 lbs] = 1.5 tons

G. Steam-Electric Power Plants

The major power plants in Arkansas are listed in Steam-Electric Plant Factors/1970[14] along with the amount of fuel they used. Figures from this book plus point source forms that were mailed to power plants were used to calculate the emissions from steam-electric power plants.

Emission factors used were derived from Table 6, page 11 of Reference 10:

NATURAL GAS
(lbs. per 10^6 cu.ft.)

Particulate	15
SO_2	0.6
CO	0.4
HC	40
NO_2	390

Emission factors used were derived from Table 5, p.10 of Ref.10:

FUEL OIL
(lbs. per 1,000 gal.)

Particulate	8
SO_2	157S*
CO	0.04
HC	5
NO_2	105

* S - wt.% sulfur

Example:

In Augusta a power plant uses $4,473 \times 10^6$ ft^3 of natural gas per year. Therefore emissions are as follows:

Particulate	15 x 4,473 x 1/2,000	=	33.5 tons
SO_2	0.6 x 4,473 x 1/2,000	=	1.3 tons
CO	0.4 x 4,473 x 1/2,000	=	0.89 tons
HC	40 x 4,473 x 1/2,000	=	89.5 tons
NO_2	390 x 4,473 x 1/2,000	=	872 tons

H. Process Losses

Process losses were calculated from point source questionnaires which were sent to all manufacturing establishments which were possible polluters. Emissions were calculated from Air Pollutant Emission Factors[10] by Duprey if no stack analysis had been done by the company.

I. Dry Cleaning

A factor of 18 lbs/capita year of dry cleaning was obtained from Duprey's Air Pollutant Emission Factors[10] and used to estimate the amount of dry cleaning done by county. Also by the same source the following assumptions were justified:

1. Assume 50% of dry cleaning uses petroleum solvents.

2. Assume 50% of dry cleaning uses synthetic solvents.

3. Assume 25% of places using synthetic solvents are controlled.

Using these assumptions, an emission factor can be derived as follows.

Petroleum Solvents	Synthetic Solvents

$$\text{Factor} = 0.5\left[\frac{305 \text{ lbs.}}{\text{ton}} \mid \frac{\text{ton}}{2{,}000 \text{ lbs.}}\right] + 0.5\left[\frac{210 \text{ lbs.}}{\text{ton}} \mid \frac{\text{ton}}{2{,}000 \text{ lbs}}(.75) + \frac{95 \text{ lbs.}}{\text{ton}} \mid \frac{\text{ton}}{2{,}000 \text{ lbs.}}(.25)\right]$$

$$= 0.1218 \frac{\text{ton HC}}{\text{ton dry cleaned}}$$

This factor was used in calculating the hydrocarbon emissions from dry cleaning operations.

Example:

Population in Benton County = 50,476

Therefore,

Tons Dry Cleaned = $50{,}476 \times \frac{18}{2{,}000}$ = 454.3 tons

HC Emissions = 454.3 x 0.1218 = 55.3 tons

J. Fuel Parameters (i.e., Sulfur Content)

Average sulfur content percentages were obtained from the Lion Oil Company in Little Rock. They are:

Fuel Oil	
#1	.061% S
#2	.400% S
#5	3.00% S
#6	3.25% S

Diesel	0.037% S
Burner Oil	0.038% S
Natural Gas	~.003% S

However, for power plants the actual sulfur content in the fuel was obtained from each company.

REFERENCES

1. Directory of Arkansas Industries, A Buyer's Guide, Arkansas Industrial Development Commission, Little Rock, Arkansas, 1970-1971.

2. Blue Book of Cotton Ginners, Southern Ginners Association, Memphis, Tennessee, 1970-1971.

3. Mineral Industry Surveys (1969), U. S. Department of the Interior, Bureau of Mines, Section of Fuels, Washington, D. C.

4. U. S. Census of Housing, Advance Report, Arkansas, U. S. Department of Commerce, Washington, D. C., 1970.

5. U. S. Census of Population, Advance Report, Arkansas, U. S. Department of Commerce, Washington, D. C., 1970.

6. Census of Manufacturers (Arkansas - 1967), U. S. Department of Commerce, Washington, D. C.

7. Arkansas State Highway Commission, 29th Biennial Report (1969-1970), Arkansas State Highway Department, Little Rock, Arkansas.

8. Waterborne Commerce of the United States (1969), Part 2, Waterways and Harbors, Gulf Coast, Mississippi River System and Antilles, Department of the Army, Corps of Engineers, New Orleans, Louisiana.

9. Air Pollutant Emission Inventory Techniques, Environmental Protection Agency, Office of Air Programs, Research Triangle Park, North Carolina.

REFERENCES, cont'd.

10. Air Pollutant Emission Factors, Environmental Protection Agency, Office of Air Programs, Research Triangle Park, North Carolina, April 1971.

11. Air Code and Water Quality Criteria for Interstate Streams for State of Arkansas, Arkansas Pollution Control Commission, Little Rock, Arkansas, August 1969.

12. Federal Register, Volume 36, No. 67, April 7, 1971, Washington, D. C.

13. 1970 Automobile Facts and Figures, Automobile Manufacturers Association, Washington, D. C.

14. Steam-Electric Plant Factors/1970, National Coal Association, Washington, D. C.

APPENDIX I

Sources Included as Point Sources, Independent of Size

CHEMICAL PROCESS INDUSTRY

- Ammonia
- Chlorine
- Coal Cleaning
- Detergent and Soap
- Hydrofluoric Acid
- Ink Manufacturing
- Paint and Varnish
- Phosphate Fertilizers
- Phosphoric Acid
- Phthalic Anhydride
- Plastics
- Sulfuric Acid
- Synthetic Fibers
- Synthetic Rubber

FOOD AND AGRICULTURAL INDUSTRY

- Alfalfa Dehydrating
- Coffee Roasting
- Cotton Ginning
- Feed and Grain
- Fermentation Processes
- Fish Meal Processing
- Rendering
- Starch Manufacturing

METALLURGICAL INDUSTRY

- Primary Metals Industry
  - Aluminum Ore Reduction
  - Copper Smelters
  - Iron and Steel Mills
  - Lead Smelters
  - Zinc Smelters

Secondary Metals Industry
- Aluminum Operations
- Brass and Bronze Smelting
- Ferro Alloys
- Gray Iron Foundry
- Lead Smelting
- Magnesium Melting
- Steel Foundry
- Zinc Processes

MINERAL PRODUCTS INDUSTRY
- Asphalt Roofing
- Asphaltic Concrete Batch
- Brick and Refractories
- Calcium Carbide
- Carbon Black
- Cement
- Ceramic and Clay Processes
- Charcoal
- Concrete Batching
- Fiber-Glass
- Frit Manufacturing
- Glass Manufacturing
- Gypsum
- Lime
- Paperboard
- Perlite
- Rock Wool
- Rock, Gravel, and Sand Processing

PETROLEUM REFINING

PULP AND PAPER MANUFACTURE

SOLVENT EVAPORATION AND GASOLINE MARKETING

- Dry Cleaning
- Surface Coating Operations
- Gasoline Marketing

MISCELLANEOUS

- Steam-Electric Power Plants
- Municipal or Equivalent Incinerators
- Open Burning Dumps

APPENDIX II

EMISSIONS INVENTORY SUMMARY BY AQCR

EMISSION TOTALS (TONS/YR)

AQCR	Part.	SO_2	CO	HC	NO_x
016	137183	8014	311186	65606	39412
017	17332	2505	94663	24812	8050
018	9587	364	27965	5558	2151
019	16049	18500	223854	73377	25635
020	26890	6123	209450	58949	38046
021	10675	1681	95608	19794	8082
022	21924	7130	56024	12675	9063
State Total	239640	44317	1018750	260771	130439

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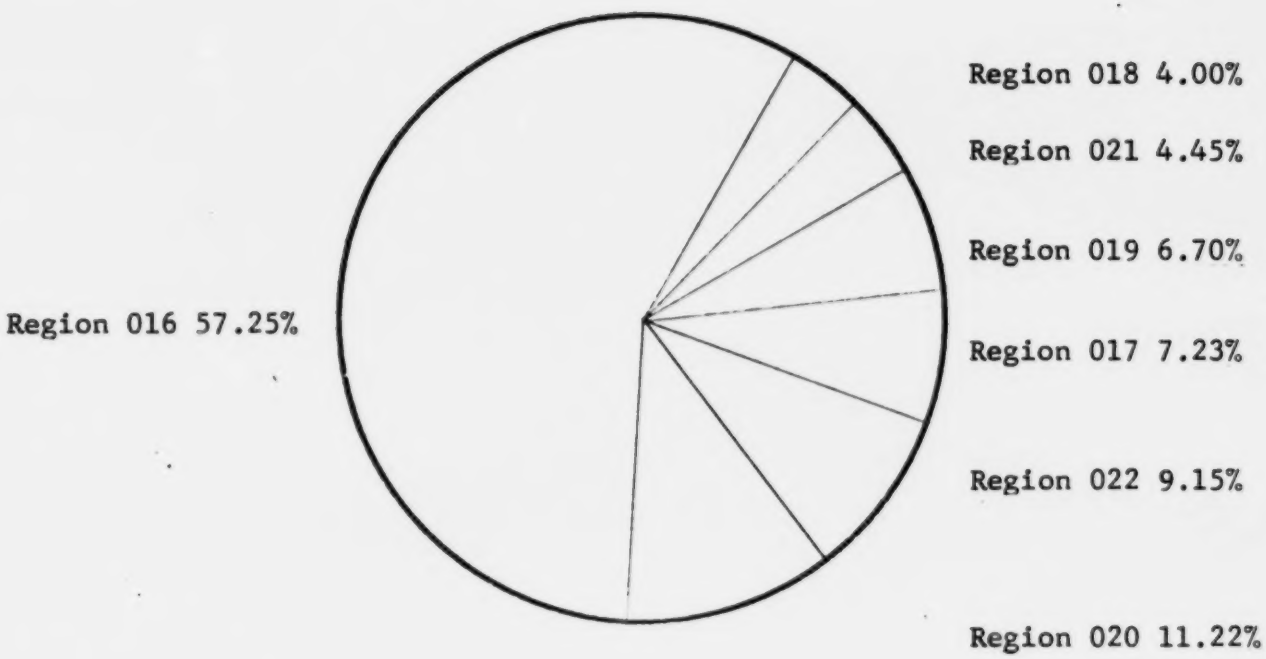
ARKANSAS

State Total

SUMMARY OF PARTICULATE EMISSIONS



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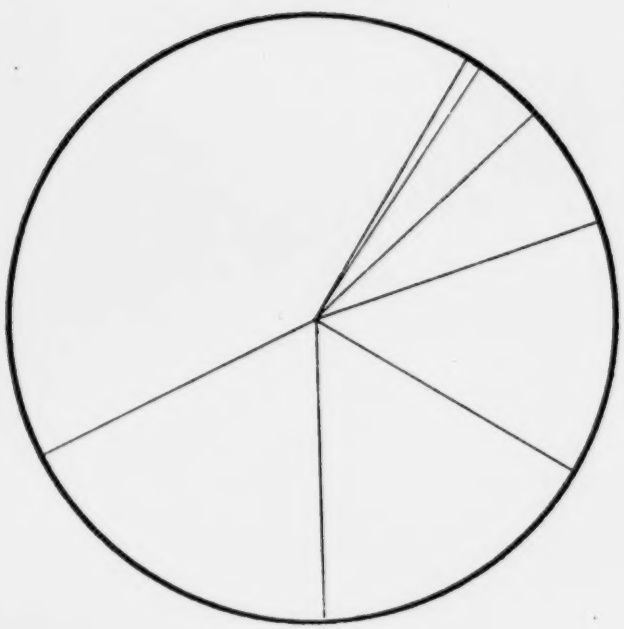
ARKANSAS

State Total

SUMMARY OF SULFUR OXIDE EMISSIONS



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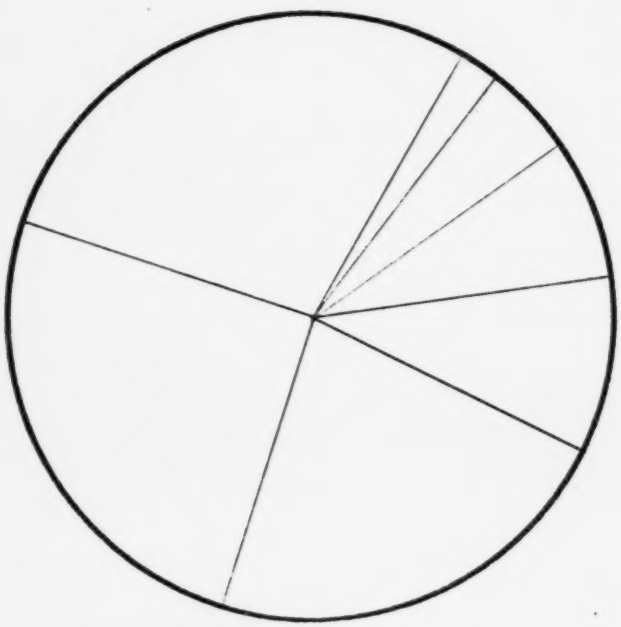
ARKANSAS

State Total

SUMMARY OF HYDROCARBON EMISSIONS



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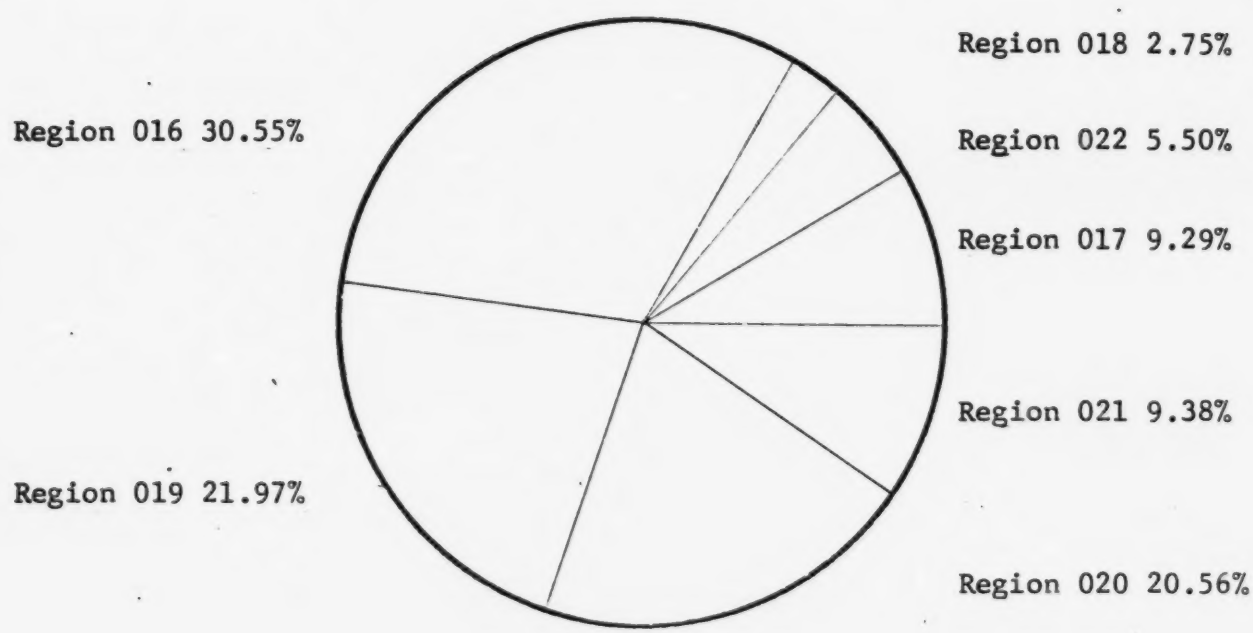
ARKANSAS

State Total

SUMMARY OF CARBON MONOXIDE EMISSIONS



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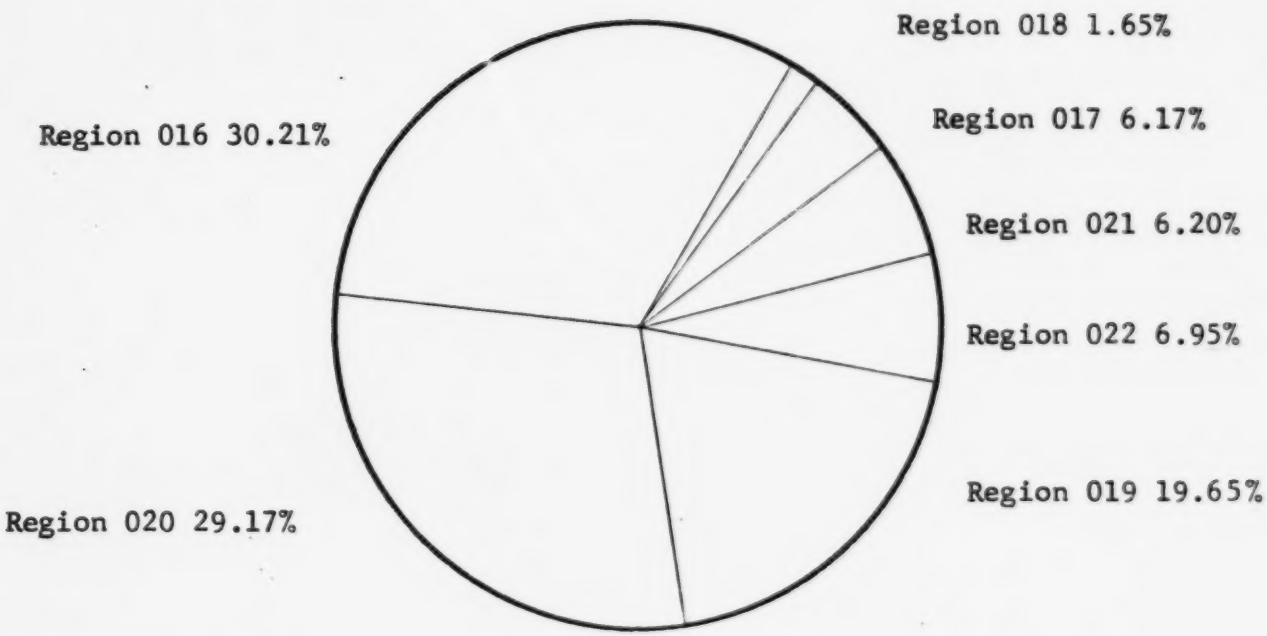
ARKANSAS

State Total

SUMMARY OF NITROGEN OXIDE EMISSIONS



EMISSIONS INVENTORY SUMMARY

AQCR 016 Arkansas 1970

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_x	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	218	7	229	92	859	22,906	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	218	7	229	92	859		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	161	419	2	33	647	21,553	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
4. Residual Oil							
a. Area Source	91	1,963	1	12	238	7,911	10^3gal.
b. Point Source	11	4	0	2	43	1,443	10^3gal.
5. Natural Gas							
a. Area Source	766	26	171	1,433	6,583	84,224	MMCF
b. Point Source	356	14	9	924	4,045	46,238	MMCF
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	33	0	0	11	3	--------	-----
9. Total	1,418	2,426	183	2,415	11,559		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	25	48	0	5	99	3,312	10^3gal.
4. Residual Oil	15	209	0	7	154	3,080	10^3gal.
5. Natural Gas	152	6	4	404	3,876	20,202	MMCF
6. Total	192	263	4	416	4,129		
D. Total Fuel Combustion	1,828	2,696	416	2,923	16,547	--------	-----

Source Category	Tons of Pollutant/Year Part	SO_2	CO	HC	NO_x	Fuel, Etc. Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	--------	-----
B. Point Source	115,866	2,609	15,280	3,164	946	--------	-----
II. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	1,664	91	14,701	1,301	379	7,555,984	Tons
2. Municipal-Point S.	5,363	20	27	27	150	209,897	Tons
B. Open Burning							
1. On Site							
a. Area Source	2,667	167	14,170	5,001	1,000	333,419	Tons
b. Point Source	571	2	1,638	136	72	82,846	Tons
2. Dumps							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	2,592	161	13,777	4,864	975	324,165	Tons
C. Boiler (wood)	4,724	346	332	330	1,649	207,567	Tons
D. Total	17,581	787	44,645	11,659	4,225		
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	1,448	1,086	247,541	33,536	13,632	241,268	10^3gal.
2. Diesel	177	341	2,452	474	2,739	15,471	10^3gal.
B. Off Highway	0	0	0	0	0	--------	-----
C. Aircraft	142	79	511	749	136	--------	-----
D. Railroad	129	207	311	705	1,153	10,227	10^3gal.
E. Vessels	12	209	30	23	34	930	10^3gal.
F. Gasoline Handling	0	0	0	11,581	0	241,268	10^3gal.
G. Other	0	0	0	0	0	--------	-----
H. Total	1,908	1,922	250,845	47,068	17,694		
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	--------	-----
B. Dry Cleaning	0	0	0	792	0	--------	-----
C. Total	0	0	0	792	0		

III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	1,664	91	14,701	1,301	379	7,555,984	Tons
2. Municipal-Point S.	5,363	20	27	27	150	209,897	Tons
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B. Off Highway	0	0	0	0	0	--------	-----
C. Aircraft	142	79	511	749	136	--------	-----
D. Railroad	129	207	311	705	1,153	10,227	10^3gal.
E. Vessels	12	209	30	23	34	930	10^3gal.
F. Gasoline Handling	0	0	0	11,581	0	241,268	10^3gal.
G. Other	0	0	0	0	0	--------	-----
H. Total	1,908	1,922	250,845	47,068	17,694		
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	--------	-----
B. Dry Cleaning	0	0	0	792	0	--------	-----
C. Total	0	0	0	792	0		
VI. GRAND TOTAL							
A. Area Source	5,811	4,504	265,418	54,431	27,021		
B. Point Source	131,372	3,510	45,768	11,175	12,391		
C. Total	137,183	8,014	311,186	65,606	39,412		

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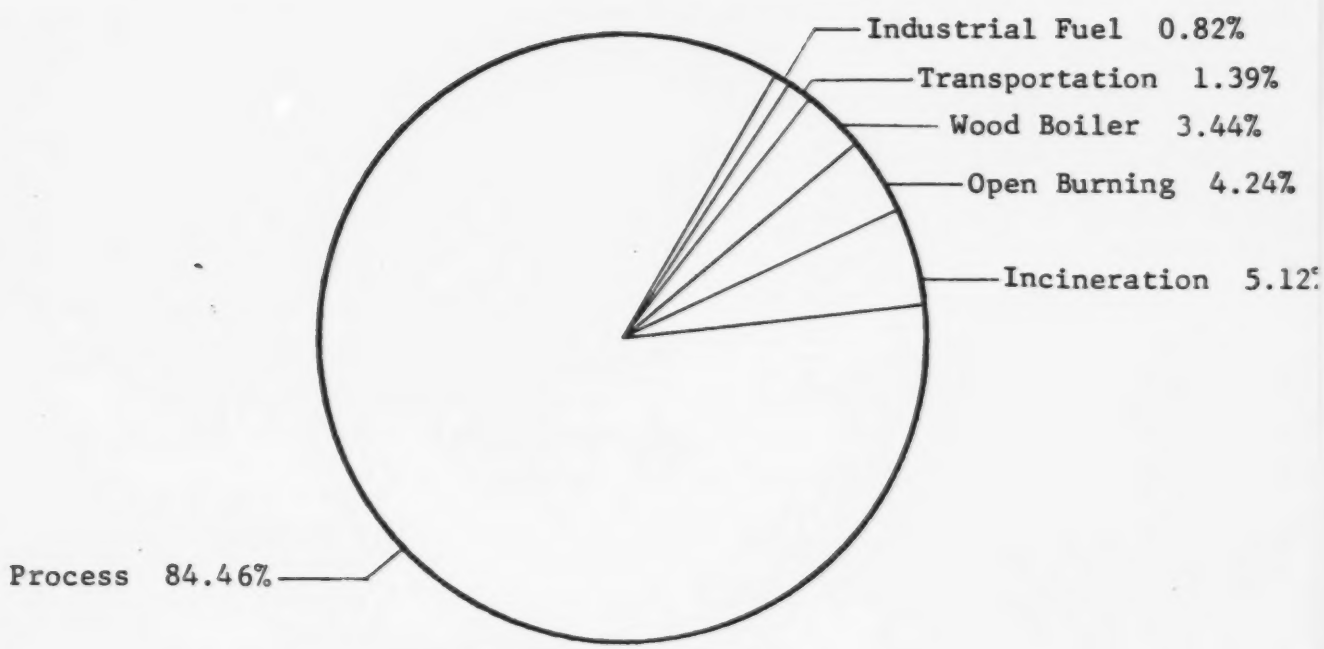
REGION 16

SUMMARY OF PARTICULATE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.15%
Commercial & Institutional Fuel	0.20%
Power Plants	0.13%
Miscellaneous	0.00%

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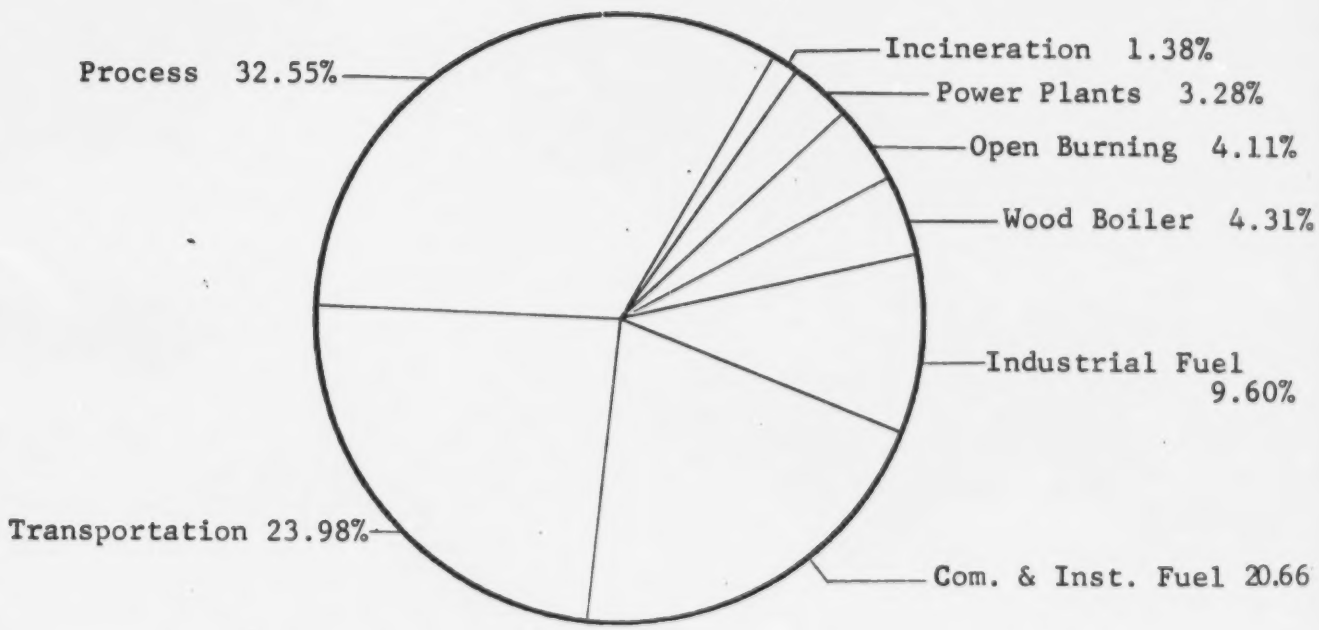
REGION 16

SUMMARY OF SULFUR OXIDE EMISSIONS

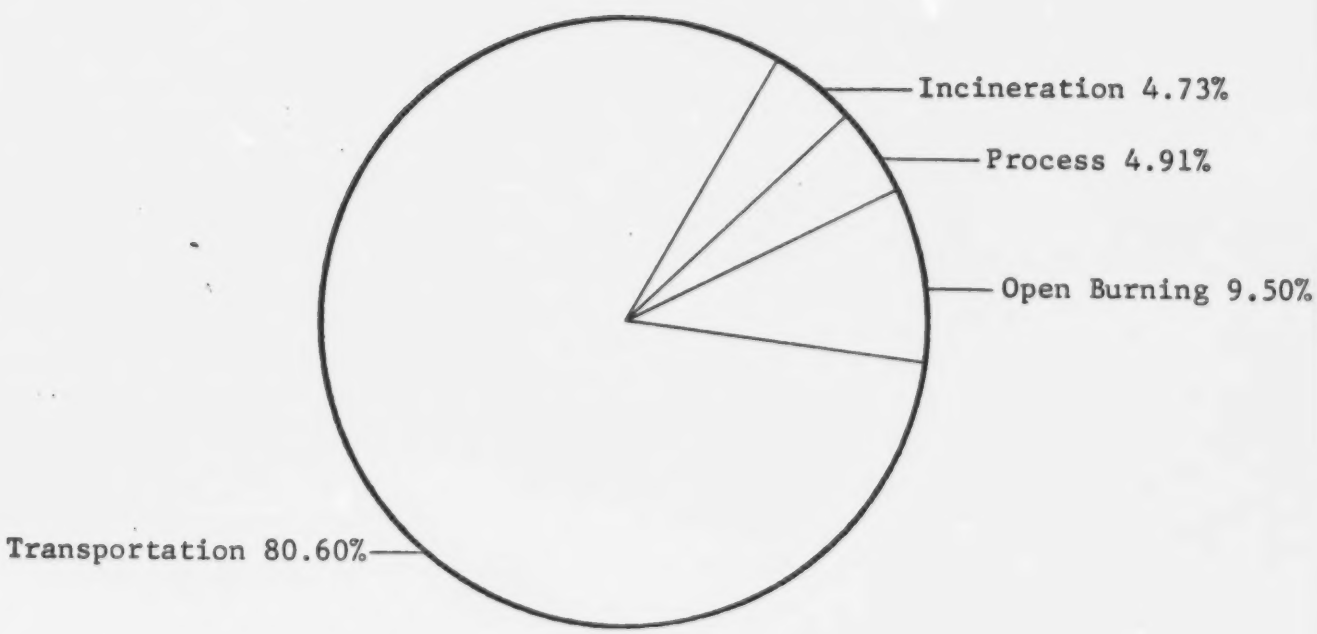


Omitted Emission Sources:

Residential Fuel	0.08%
Miscellaneous	0.00%

REGION 16

SUMMARY OF CARBON MONOXIDE EMISSIONS

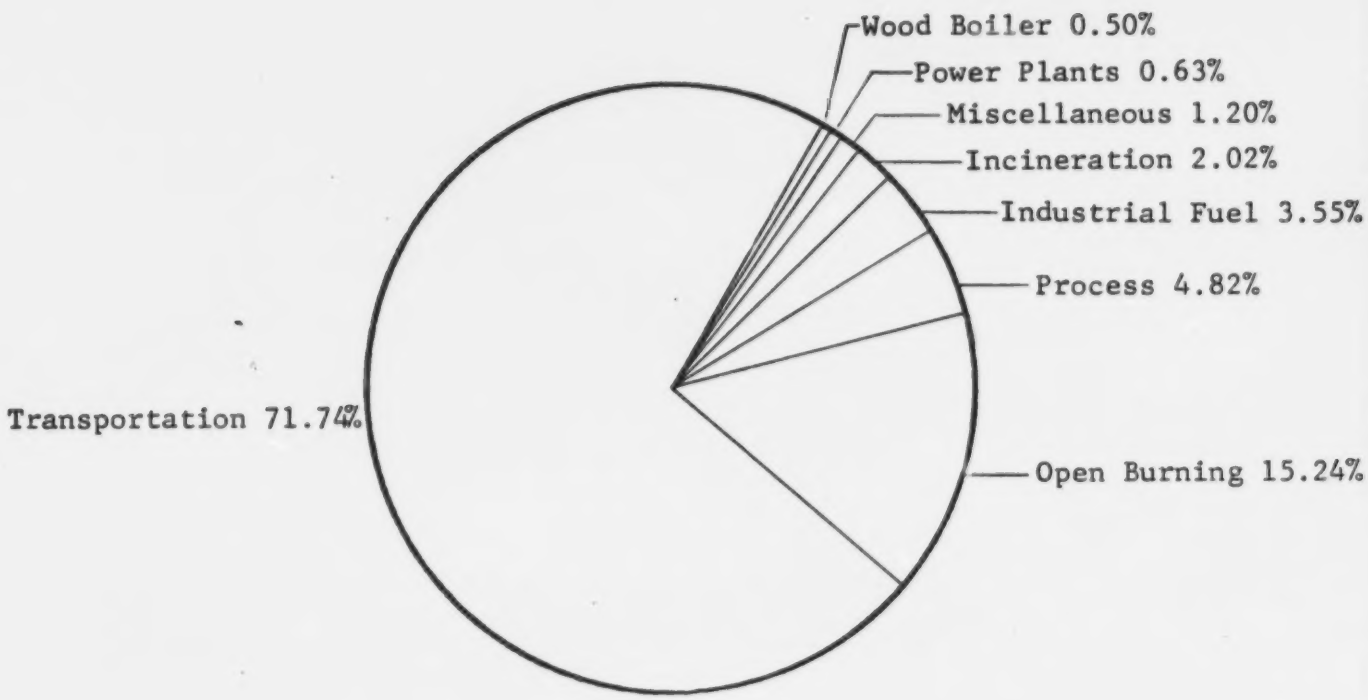


Omitted Emission Sources:

Residential Fuel	0.07%
Com. & Inst. Fuel	0.05%
Industrial Fuel	0.00%
Power Plants	0.00%
Wood Boiler	0.10%
Miscellaneous	0.00%

REGION 16

SUMMARY OF HYDROCARBON EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.14%
Com. & Inst. Fuel	0.12%

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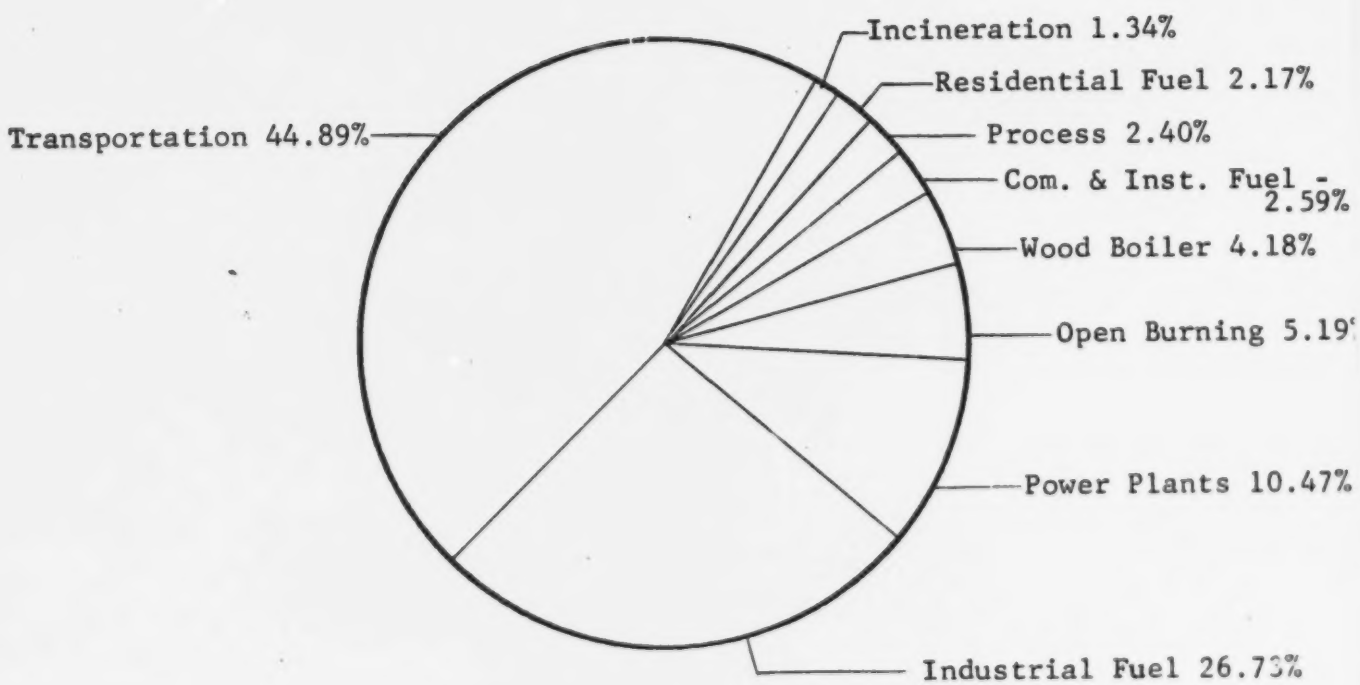
REGION 16

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Miscellaneous 0.00%

EMISSIONS INVENTORY SUMMARY

AQCR 017 Arkansas 1970

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_x	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	77	2	81	32	304	8,119	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	77	2	81	32	304		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	87	226	1	17	349	11,631	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
4. Residual Oil							
a. Area Source	76	1,641	1	10	199	6,616	10^3gal.
b. Point Source	2	4	0	0	5	157	10^3gal.
5. Natural Gas							
a. Area Source	153	5	69	226	1,121	16,666	MMCF
b. Point Source	16	1	0	35	153	1,752	MMCF
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	--------	-----
9. Total	334	1,877	71	288	1,827		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	0	0	0	0	0	--------	-----
4. Residual Oil	0	0	0	0	0	--------	-----
5. Natural Gas	0	0	0	0	0	--------	-----
[illegible]	0	0	0	0	0		

1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	77	2	81	32	304	8,119	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	77	2	81	32	304		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	87	226	1	17	349	11,631	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
4. Residual Oil							
a. Area Source	76	1,641	1	10	199	6,616	10^3gal.
b. Point Source	2	4	0	0	5	157	10^3gal.
5. Natural Gas							
a. Area Source	153	5	69	226	1,121	16,666	MMCF
b. Point Source	16	1	0	35	153	1,752	MMCF
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	--------	-----
9. Total	334	1,877	71	288	1,827		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	0	0	0	0	0	--------	-----
4. Residual Oil	0	0	0	0	0	--------	-----
5. Natural Gas	0	0	0	0	0	--------	-----
6. Total	0	0	0	0	0		
D. Total Fuel Combustion	411	1,879	152	320	2,131	--------	-----

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	--------	-----
B. Point Source	14,074	0	368	6,353	1	--------	-----
II. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	556	9	10,143	866	80	NA	-----
2. Municipal-Point S.	0	0	0	0	0	--------	-----
B. Open Burning							
1. On Site							
a. Area Source	1,364	85	7,246	2,557	511	170,493	Tons
b. Point Source	12	0	36	4	1	NA	-----
2. Dumps							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	335	21	1,781	628	126	41,900	Tons
C. Boiler (wood)	62	3	5	5	22	--------	-----
D. Total	2,329	118	19,211	4,060	740	--------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	433	325	74,122	10,042	4,082	72,244	10^3gal
2. Diesel	53	102	730	141	816		
B. Off Highway	0	0	0	0	0	--------	-----
C. Aircraft	0	0	0	0	0	--------	-----
D. Railroad	30	49	75	169	275		
E. Vessels	2	32	5	4	5	142	10^3gal
F. Gasoline Handling	0	0	0	3,468	0	72,244	10^3gal
G. Other	0	0	0	0	0	--------	-----
H. Total	518	508	74,932	13,824	5,178		
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	--------	-----
B. Dry Cleaning	0	0	0	255	0	--------	-----
C. Total	0	0	0	255	0		

II. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	556	9	10,143	866	80	NA	-----
2. Municipal-Point S.	0	0	0	0	0	--------	-----
B. Open Burning							
1. On Site							
a. Area Source	1,364	85	7,246	2,557	511	170,493	Tons
b. Point Source	12	0	36	4	1	NA	-----
2. Dumps							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	335	21	1,781	628	126	41,900	Tons
C. Boiler (wood)	62	3	5	5	22	--------	-----
D. Total	2,329	118	19,211	4,060	740	--------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	433	325	74,122	10,042	4,082	72,244	10^3gal
2. Diesel	53	102	730	141	816		
B. Off Highway	0	0	0	0	0	--------	-----
C. Aircraft	0	0	0	0	0	--------	-----
D. Railroad	30	49	75	169	275		
E. Vessels	2	32	5	4	5	142	10^3gal
F. Gasoline Handling	0	0	0	3,468	0	72,244	10^3gal
G. Other	0	0	0	0	0	--------	-----
H. Total	518	508	74,932	13,824	5,178		
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	--------	-----
B. Dry Cleaning	0	0	0	255	0	--------	-----
C. Total	0	0	0	255	0		
VI. GRAND TOTAL							
A. Area Source	2,275	2,467	82,330	16,921	7,662	--------	-----
B. Point Source	15,057	38	12,333	7,891	388	--------	-----
C. Total	17,33?	2,505	94,663	24,812	8,050		

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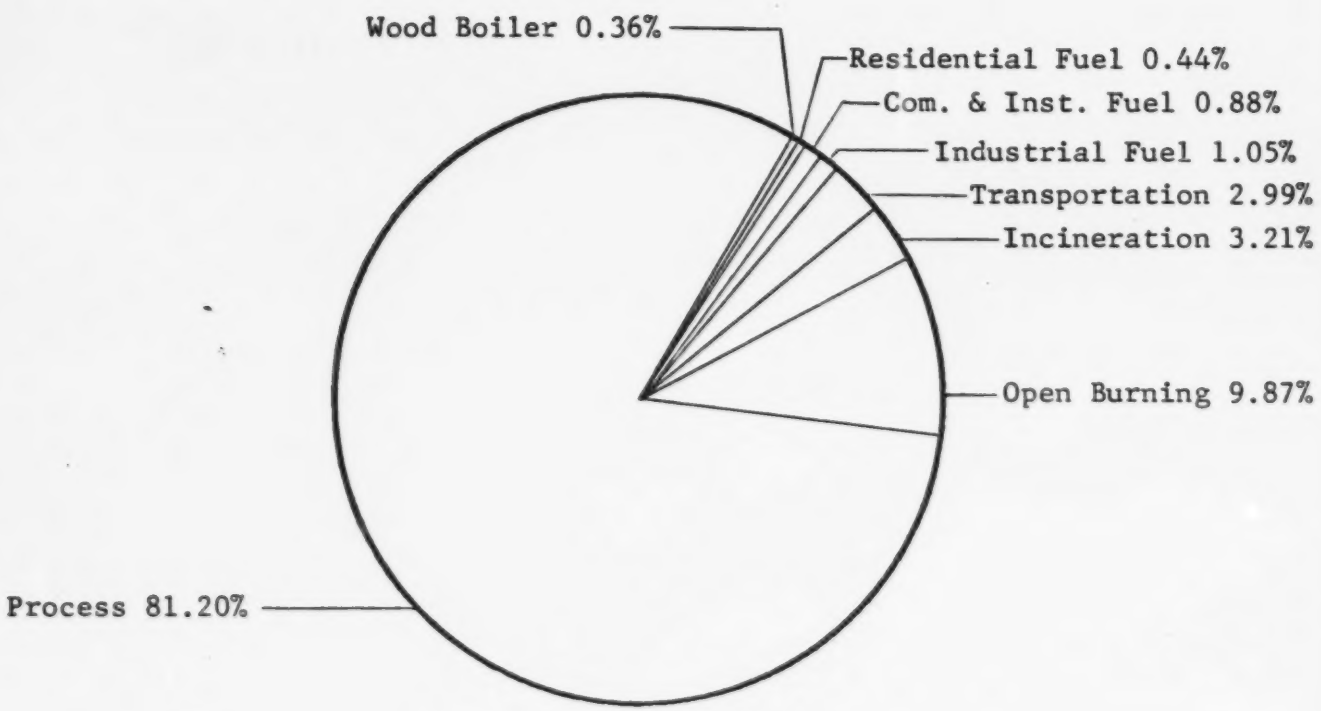
REGION 17

SUMMARY OF PARTICULATE EMISSIONS



Omitted Emission Sources:

Power Plants	0.00%
Miscellaneous	0.00%

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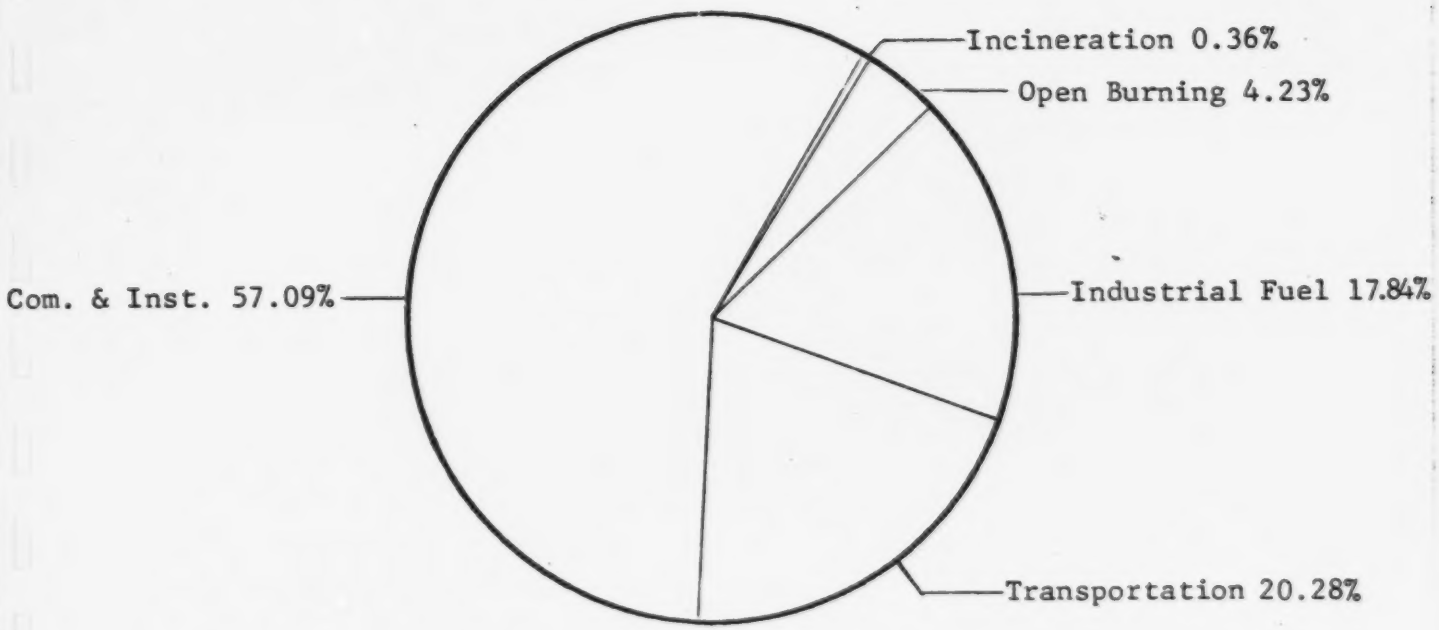
REGION 17

SUMMARY OF SULFUR OXIDE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.08%
Power Plants	0.00%
Process	0.00%
Wood Boiler	0.12%
Miscellaneous	0.00%

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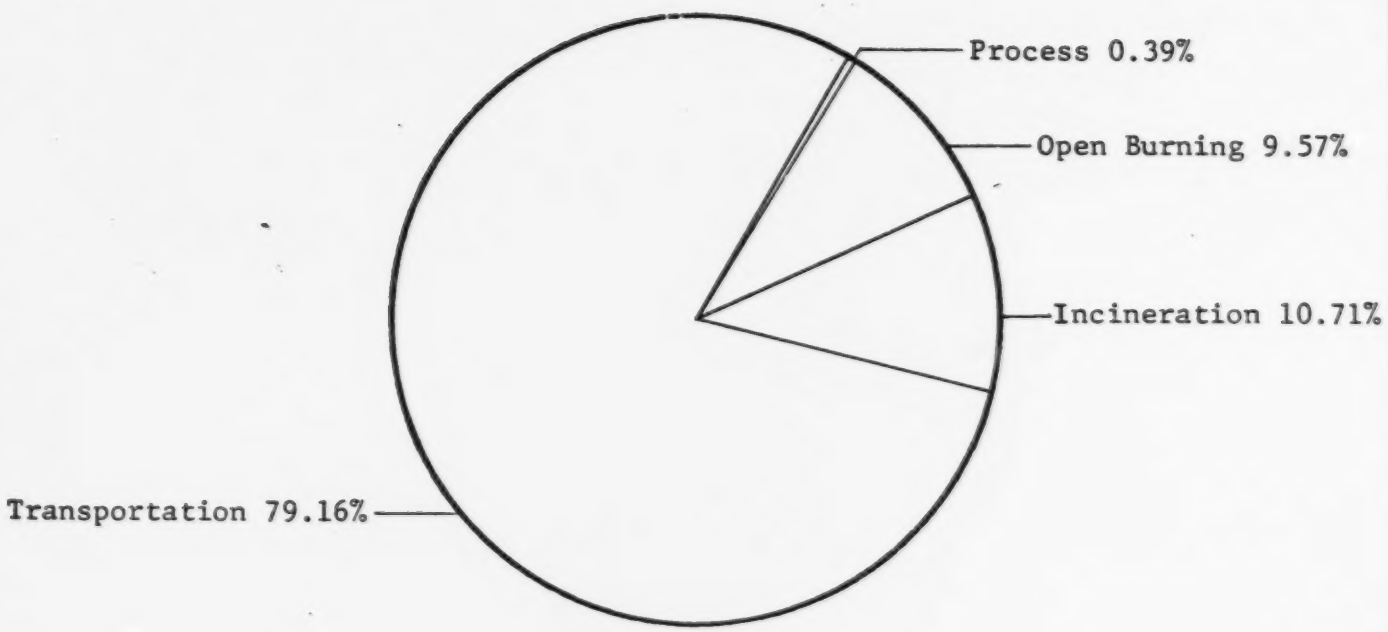
REGION 17

SUMMARY OF CARBON MONOXIDE EMISSIONS

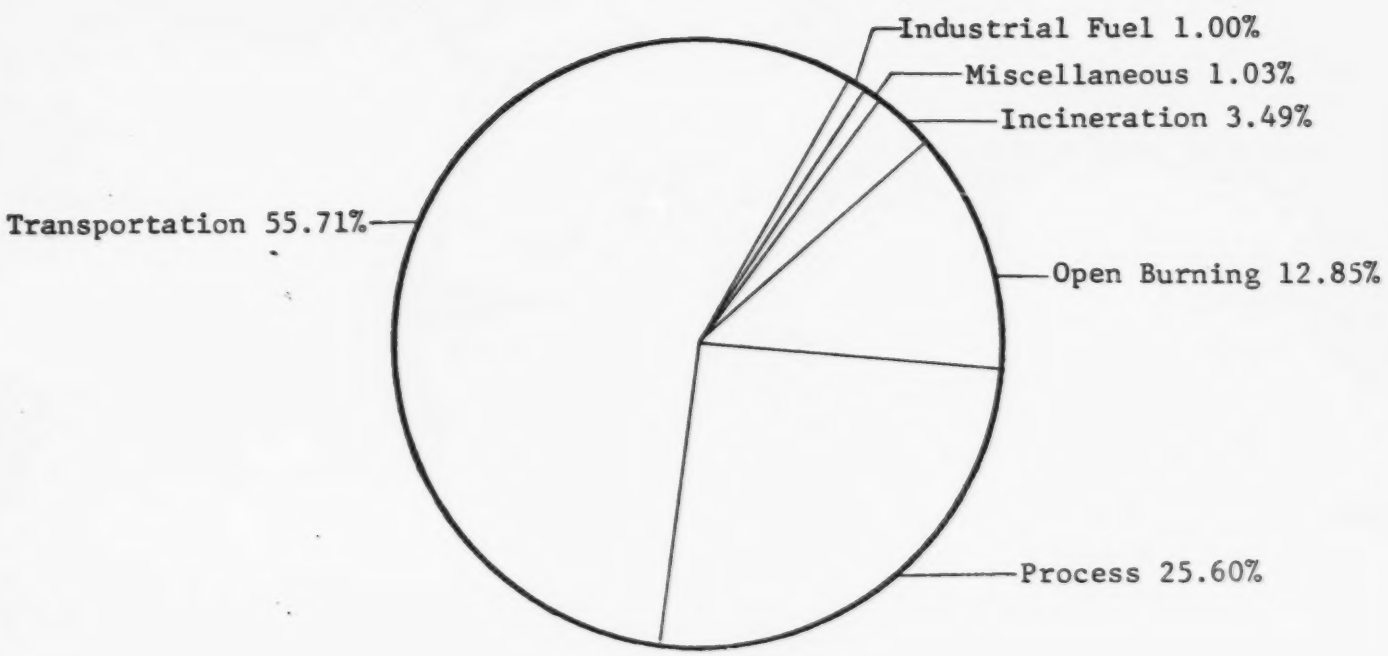


Omitted Emission Sources:

Residential Fuel	0.09%
Com. & Inst. Fuel	0.07%
Industrial Fuel	0.00%
Power Plants	0.00%
Wood Boiler	0.01%
Miscellaneous	0.00%

REGION 17

SUMMARY OF HYDROCARBON EMISSIONS

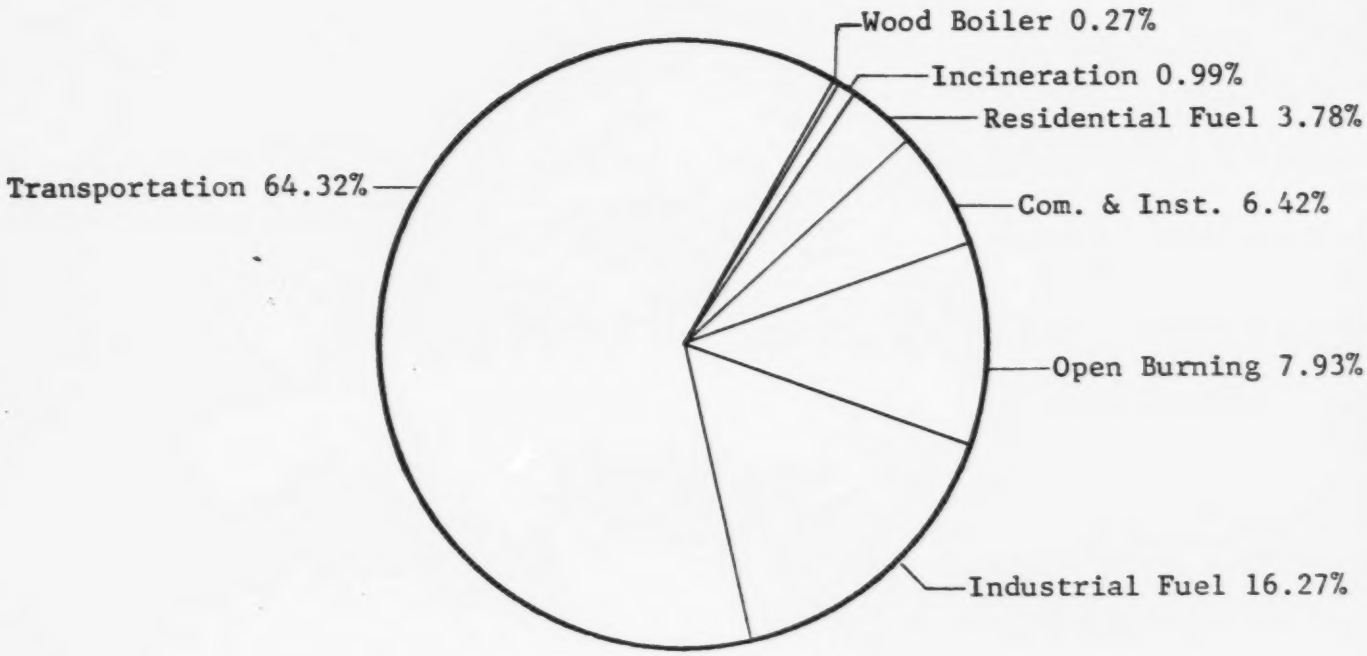


Omitted Emission Sources:

Residential	0.13%
Com. & Inst. Fuel	0.16%
Power Plant	0.00%
Wood Boiler	0.02%

REGION 17

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Power Plants	0.00%
Process	0.01%
Miscellaneous	0.00%

EMISSIONS INVENTORY SUMMARY

AQCR 018 Arkansas 1970

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	9	0	9	4	34	909	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	9	0	9	4	34		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	8	22	0	2	34	1,128	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
4. Residual Oil							
a. Area Source	7	147	0	1	18	590	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
5. Natural Gas							
a. Area Source	14	0	7	19	99	1,538	MMCF
b. Point Source	0	0	0	0	0	--------	-----
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	--------	-----
9. Total	29	169	7	22	151		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	0	0	0	0	0	--------	-----
4. Residual Oil	0	0	0	0	0	--------	-----
5. Natural Gas	0	0	0	0	0	--------	-----
6. Total	0	0	0	0	0		

2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	9	0	9	4	34	909	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	9	0	9	4	34		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	8	22	0	2	34	1,128	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
4. Residual Oil							
a. Area Source	7	147	0	1	18	590	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
5. Natural Gas							
a. Area Source	14	0	7	19	99	1,538	MMCF
b. Point Source	0	0	0	0	0	--------	-----
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	--------	-----
9. Total	29	169	7	22	151		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	0	0	0	0	0	--------	-----
4. Residual Oil	0	0	0	0	0	--------	-----
5. Natural Gas	0	0	0	0	0	--------	-----
6. Total	0	0	0	0	0		
D. Total Fuel Combustion	38	169	16	26	185	--------	-----

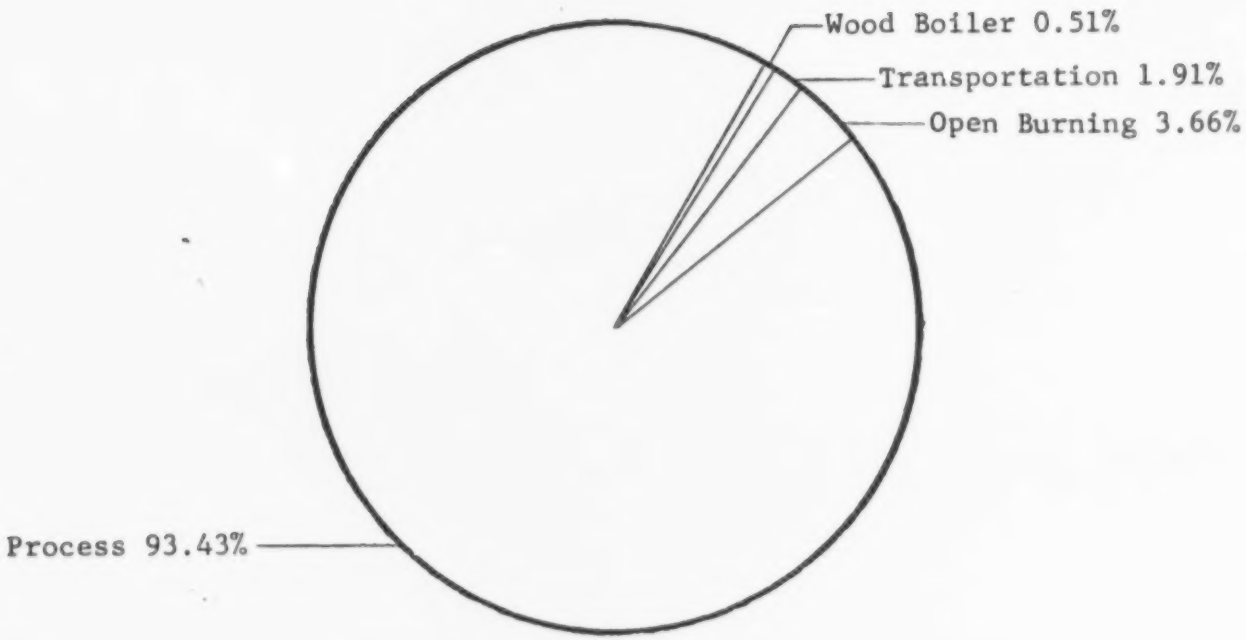
Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	--------	-----
B. Point Source	8,957	0	38	11	0	--------	-----
III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	9	0	152	14	1	--------	-----
2. Municipal-Point S.	0	0	0	0	0	--------	-----
B. Open Burning							
1. On Site							
a. Area Source	195	12	1,037	366	73	24,397	Tons
b. Point Source	0	0	0	0	0	--------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	156	10	829	293	59	19,500	Tons
C. Boiler (wood)	49	3	4	4	18	--------	-----
D. Total	409	25	2,022	677	151		
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	150	112	25,604	3,469	1,410	24,955	10^3gal
2. Diesel	19	36	252	49	282	1,600	10^3gal
B. Off Highway	0	0	0	0	0	--------	-----
C. Aircraft	0	0	0	0	0	--------	-----
D. Railroad	14	22	33	75	123	829	10^3gal
E. Vessels	0	0	0	0	0	--------	-----
F. Gasoline Handling	0	0	0	1,198	0	24,955	10^3gal
G. Other	0	0	0	0	0	--------	-----
H. Total	183	170	25,889	4,791	1,813	--------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	--------	-----
B. Dry Cleaning	0	0	0	53	0	--------	-----
C. Total	0	0	0	53	0		

VI. GRAND TOTAL

A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	9	0	152	14	1	--------	-----
2. Municipal-Point S.	0	0	0	0	0	--------	-----
B. Open Burning							
1. On Site							
a. Area Source	195	12	1,037	366	73	24,397	Tons
b. Point Source	0	0	0	0	0	--------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	156	10	829	293	59	19,500	Tons
C. Boiler (wood)	49	3	4	4	18	--------	-----
D. Total	409	25	2,022	677	151		
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	150	112	25,604	3,469	1,410	24,955	10^3gal.
2. Diesel	19	36	252	49	282	1,600	10^3gal.
B. Off Highway	0	0	0	0	0	--------	-----
C. Aircraft	0	0	0	0	0	--------	-----
D. Railroad	14	22	33	75	123	829	10^3gal.
E. Vessels	0	0	0	0	0	--------	-----
F. Gasoline Handling	0	0	0	1,198	0	24,955	10^3 gal
G. Other	0	0	0	0	0	--------	-----
H. Total	183	170	25,889	4,791	1,813	--------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	--------	-----
B. Dry Cleaning	0	0	0	53	0	--------	-----
C. Total	0	0	0	53	0		
VI. GRAND TOTAL							
A. Area Source	416	351	26,942	5,236	2,073	--------	-----
B. Point Source	9,171	13	1,023	322	78	--------	-----
C. Total	9,587	364	27,965	5,558	2,151		

REGION 18

SUMMARY OF PARTICULATE EMISSIONS

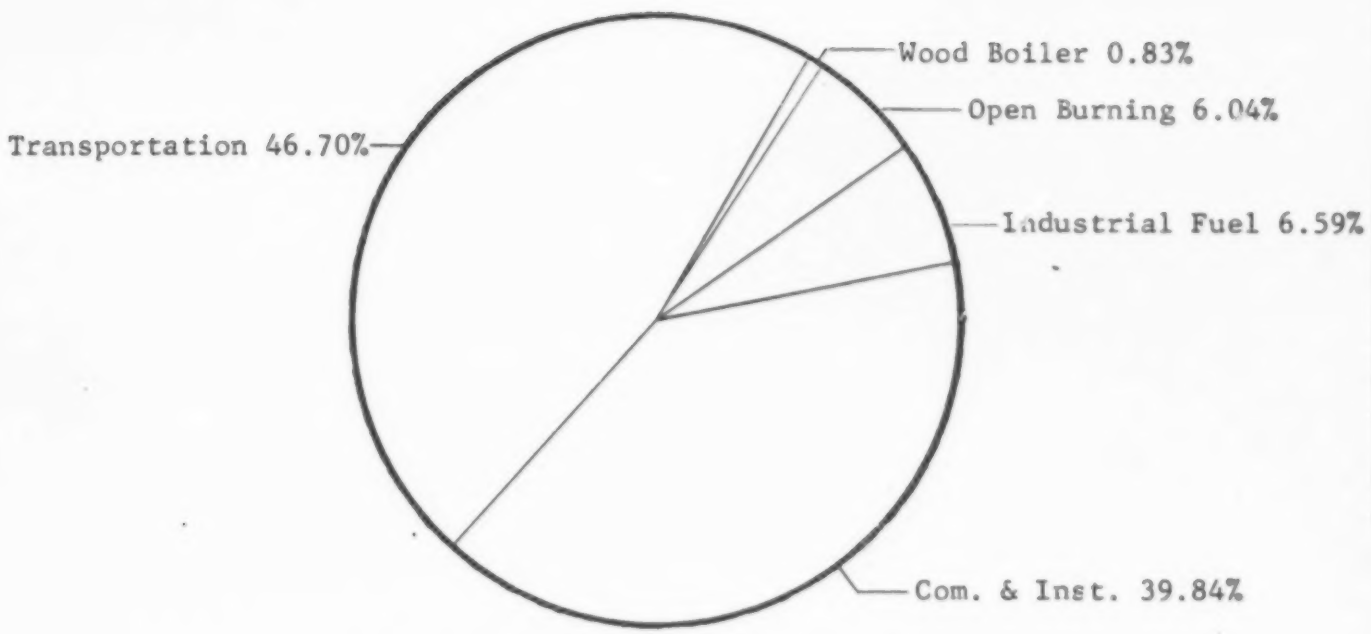


Omitted Emission Sources:

Residential Fuel	0.09%
Com. & Inst. Fuel	0.19%
Industrial Fuel	0.12%
Power Plants	0.00%
Incineration	0.09%
Miscellaneous	0.00%

REGION 18

SUMMARY OF SULFUR OXIDE EMISSIONS

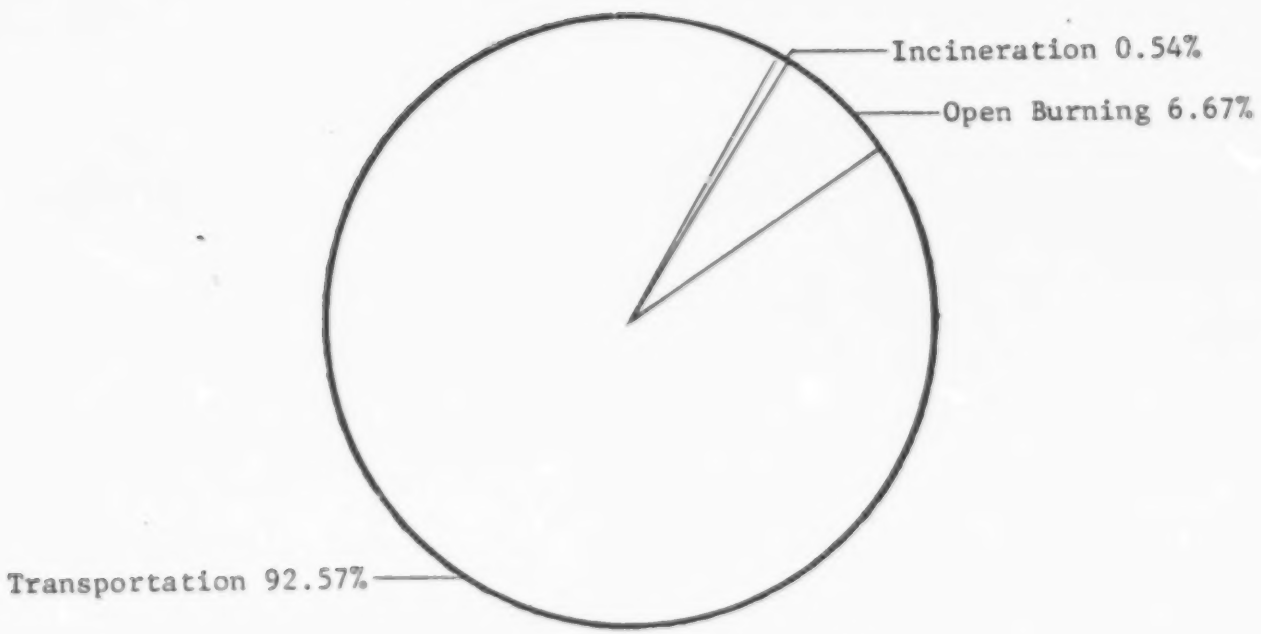


Omitted Emission Sources:

Residential Fuel	0.00%
Power Plants	0.00%
Process	0.00%
Incineration	0.00%
Miscellaneous	0.00%

REGION 18

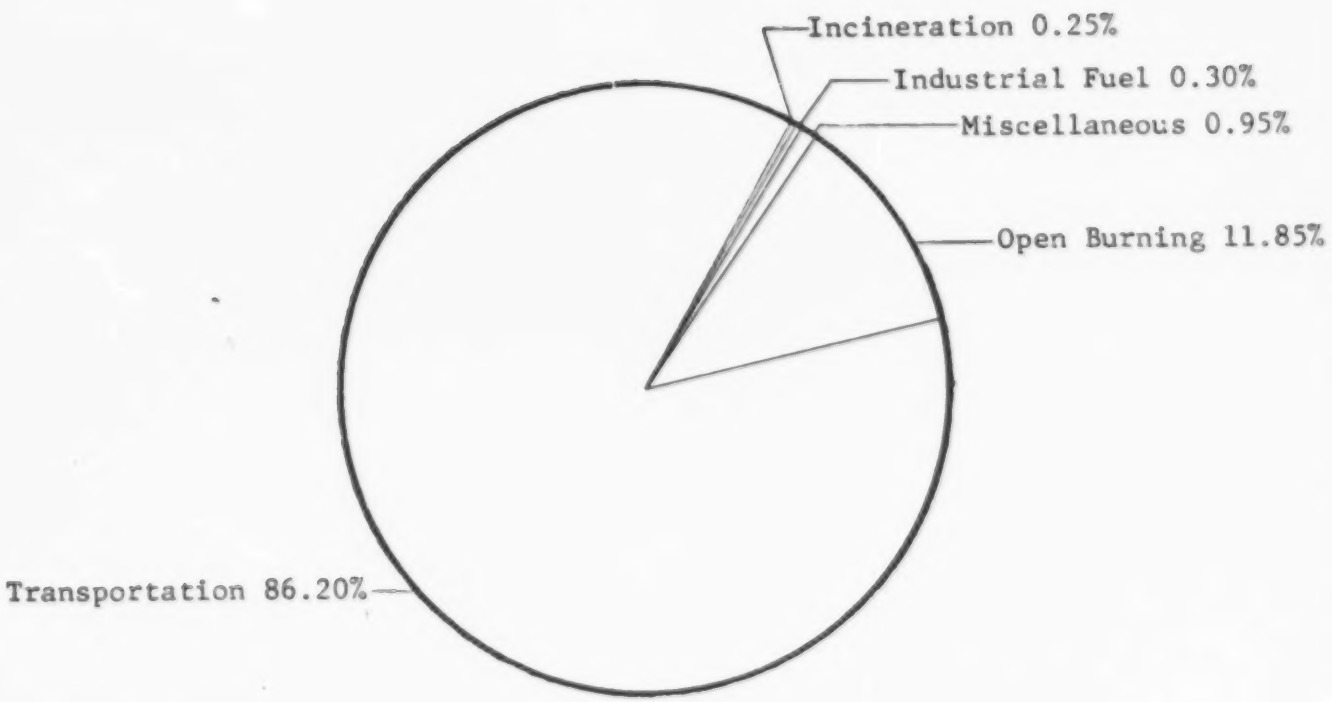
SUMMARY OF CARBON MONOXIDE EMISSIONS



Omitted Emission Sources:	
Residential Fuel	0.03%
Com. & Inst. Fuel	0.02%
Industrial Fuel	0.00%
Power Plants	0.00%
Process	0.13%
Wood Boiler	0.01%
Miscellaneous	0.00%

REGION 18

SUMMARY OF HYDROCARBON EMISSIONS

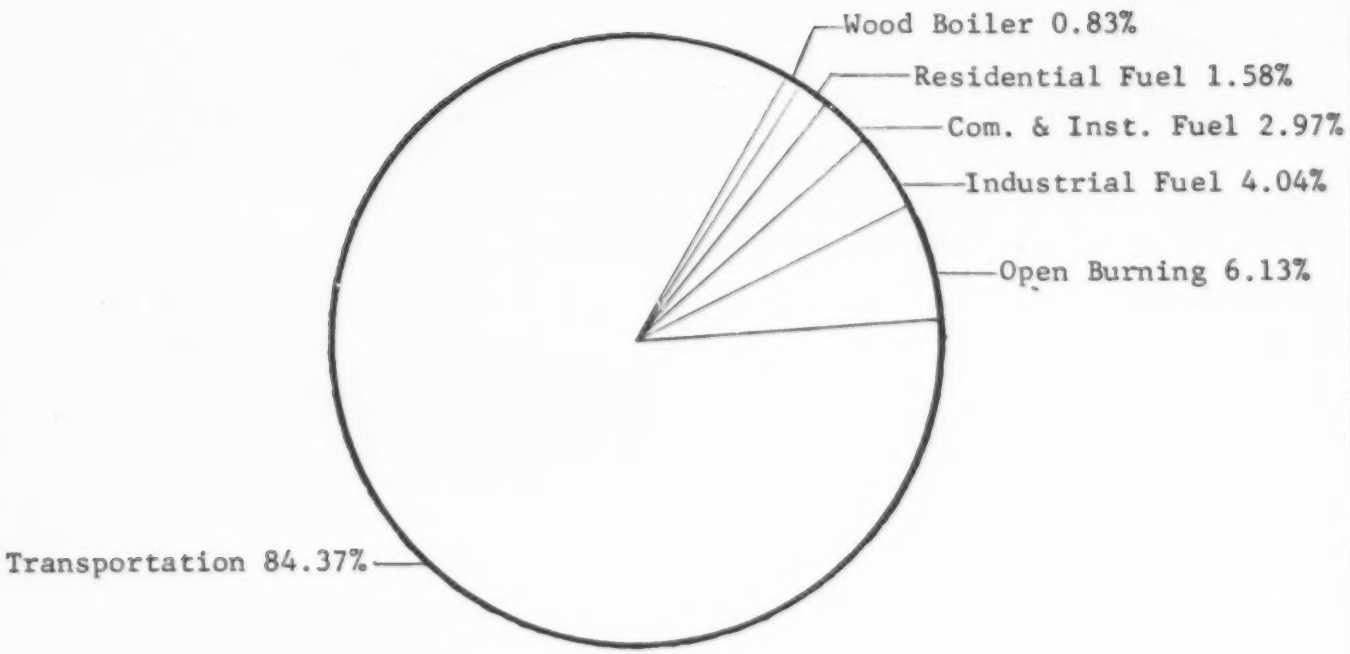


Omitted Emission Sources:

Residential Fuel	0.07%
Com. & Inst. Fuel	0.08%
Power Plants	0.00%
Process	0.19%
Wood Boiler	0.07%

REGION 18

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Power Plants	0.00%
Process	0.00%
Incineration	0.04%
Miscellaneous	0.00%

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	------	-----
B. Point Source	5,254	16,658	164,052	60,657	15,418	------	-----
III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	312	3	5,787	488	45	------	-----
2. Municipal-Point S.	0	0	0	0	0	------	-----
B. Open Burning							
1. On Site							
a. Area Source	845	53	4,490	1,585	317	105,658	Tons
b. Point Source	256	3	900	139	42	-------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	-------	-----
b. Point Source	102	6	541	191	39	12,750	Tons
C. Boiler (wood)	8,504	466	619	619	3,092	-------	-----
D. Total	10,019	531	12,337	3,022	3,535	-------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	274	205	46,809	6,342	2,578	45,623	10^3 gal
2. Diesel	32	62	459	88	512	2,924	10^3 gal
B. Off Highway	0	0	0	0	0	-------	-----
C. Aircraft	3	1	6	18	3	-------	-----
D. Railroad	52	86	128	290	474	1,328	10^3 gal
E. Vessels	0	0	0	0	0	-------	-----
F. Gasoline Handling	0	0	0	2,190	0	45,623	10^3 ga
G. Other	0	0	0	0	0	-------	-----
H. Total	361	354	47,402	8,928	3,567	-------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	-------	-----
B. Dry Cleaning	0	0	0	142	0	-------	-----
C. Total	0	0	0	142	0	-------	-----

III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	-------	-----
b. Point Source	312	3	5,787	488	45	-------	-----
2. Municipal-Point S.	0	0	0	0	0	-------	-----
B. Open Burning							
1. On Site							
a. Area Source	845	53	4,490	1,585	317	105,658	Tons
b. Point Source	256	3	900	139	42	-------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	-------	-----
b. Point Source	102	6	541	191	39	12,750	Tons
C. Boiler (wood)	8,504	466	619	619	3,092	-------	-----
D. Total	10,019	531	12,337	3,022	3,535	-------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	274	205	46,809	6,342	2,578	45,623	10^3 gal
2. Diesel	32	62	459	88	512	2,924	10^3 gal
B. Off Highway	0	0	0	0	0	-------	-----
C. Aircraft	3	1	6	18	3	-------	-----
D. Railroad	52	86	128	290	474	1,328	10^3 gal
E. Vessels	0	0	0	0	0	-------	-----
F. Gasoline Handling	0	0	0	2,190	0	45,623	10^3 ga
G. Other	0	0	0	0	0	-------	-----
H. Total	361	354	47,402	8,928	3,567	-------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	-------	-----
B. Dry Cleaning	0	0	0	142	0	-------	-----
C. Total	0	0	0	142	0	-------	-----
VI. GRAND TOTAL							
A. Area Source	1,382	1,289	51,950	10,787	4,777	-------	-----
B. Point Source	14,667	17,211	171,904	62,590	20,858	-------	-----
C. Total	16,049	18,500	223,854	73,377	25,635	-------	-----

EMISSIONS INVENTORY SUMMARY

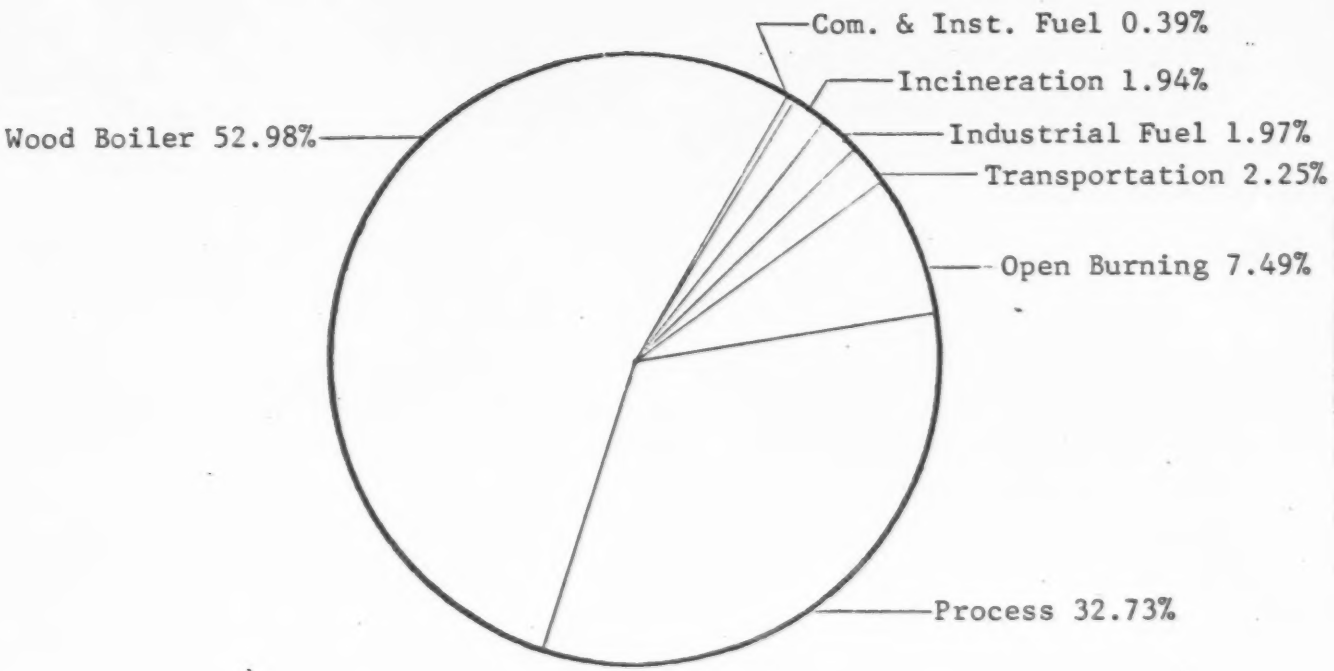
AQCR 019 Arkansas 1970

Source Category	Tons of Pollutant/Year Part	SO_x	CO	HC	NO_x	Fuel, Etc. Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	36	1	38	15	142	3,781	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	36	1	38	15	142		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	43	111	0	9	171	5,701	10^3gal.
b. Point Source	17	68	0	3	67	2,239	10^3gal.
4. Residual Oil							
a. Area Source	36	768	0	5	93	3,095	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
5. Natural Gas							
a. Area Source	61	2	20	103	487	6,638	MMCF
b. Point Source	222	7	5	493	2,155	24,630	MMCF
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	--------	-----
9. Total	379	956	25	613	2,973		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	0	0	0	0	0	--------	-----
4. Residual Oil	0	0	0	0	0	--------	-----
5. Natural Gas	0	0	0	0	0	--------	-----
6. Total	0	0	0	0	0		

2. Distillate Oil	0	0	0	0	0	--------	-----
3. Natural Gas	36	1	38	15	142	3,781	MMCF
4. Wood	0	0	0	0	0	--------	-----
5. Total	36	1	38	15	142		
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
2. Coke - Point Source	0	0	0	0	0	--------	-----
3. Distillate Oil							
a. Area Source	43	111	0	9	171	5,701	10^3gal.
b. Point Source	17	68	0	3	67	2,239	10^3gal.
4. Residual Oil							
a. Area Source	36	768	0	5	93	3,095	10^3gal.
b. Point Source	0	0	0	0	0	--------	-----
5. Natural Gas							
a. Area Source	61	2	20	103	487	6,638	MMCF
b. Point Source	222	7	5	493	2,155	24,630	MMCF
6. Process Gas-Point S.	0	0	0	0	0	--------	-----
7. Wood							
a. Area Source	0	0	0	0	0	--------	-----
b. Point Source	0	0	0	0	0	--------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	--------	-----
9. Total	379	956	25	613	2,973		
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	--------	-----
2. Bituminous Coal	0	0	0	0	0	--------	-----
3. Distillate Oil	0	0	0	0	0	--------	-----
4. Residual Oil	0	0	0	0	0	--------	-----
5. Natural Gas	0	0	0	0	0	--------	-----
6. Total	0	0	0	0	0		
D. Total Fuel Combustion	415	957	63	628	3,115		

REGION 19

SUMMARY OF PARTICULATE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.22%
Power Plants	0.00%
Miscellaneous	0.00%

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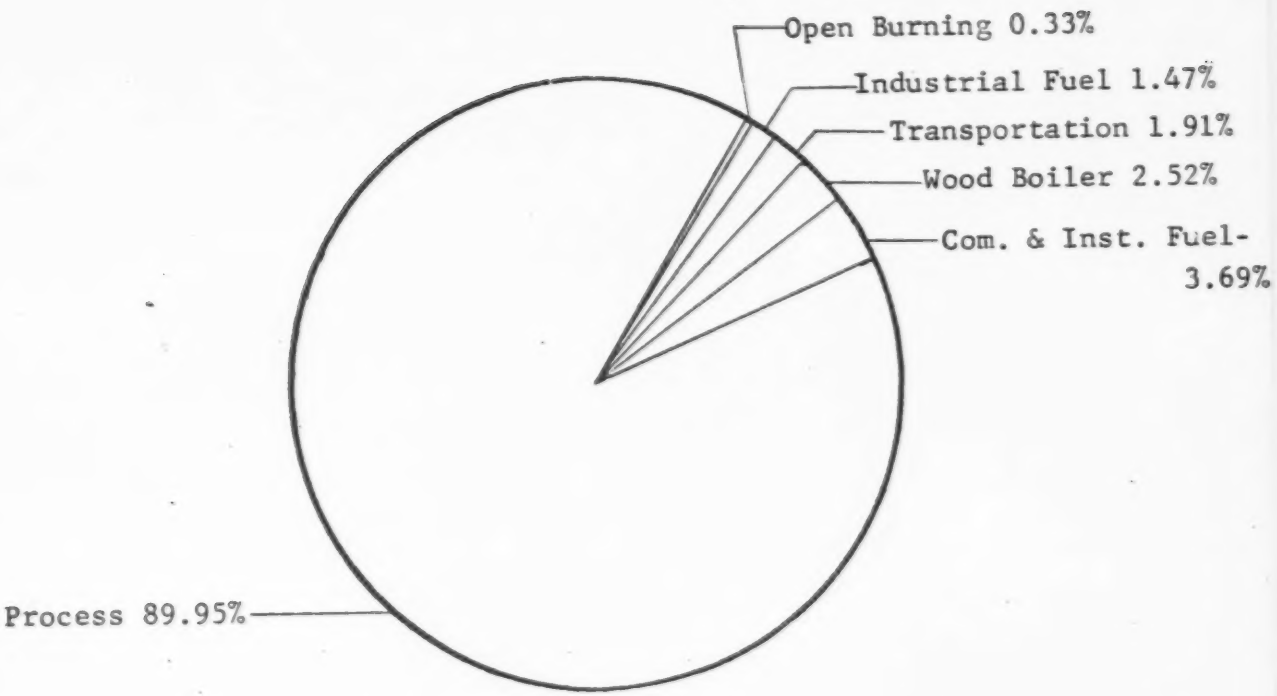
REGION 19

SUMMARY OF SULFUR DIOXIDE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.01%
Power Plants	0.00%
Incineration	0.02%
Miscellaneous	0.00%

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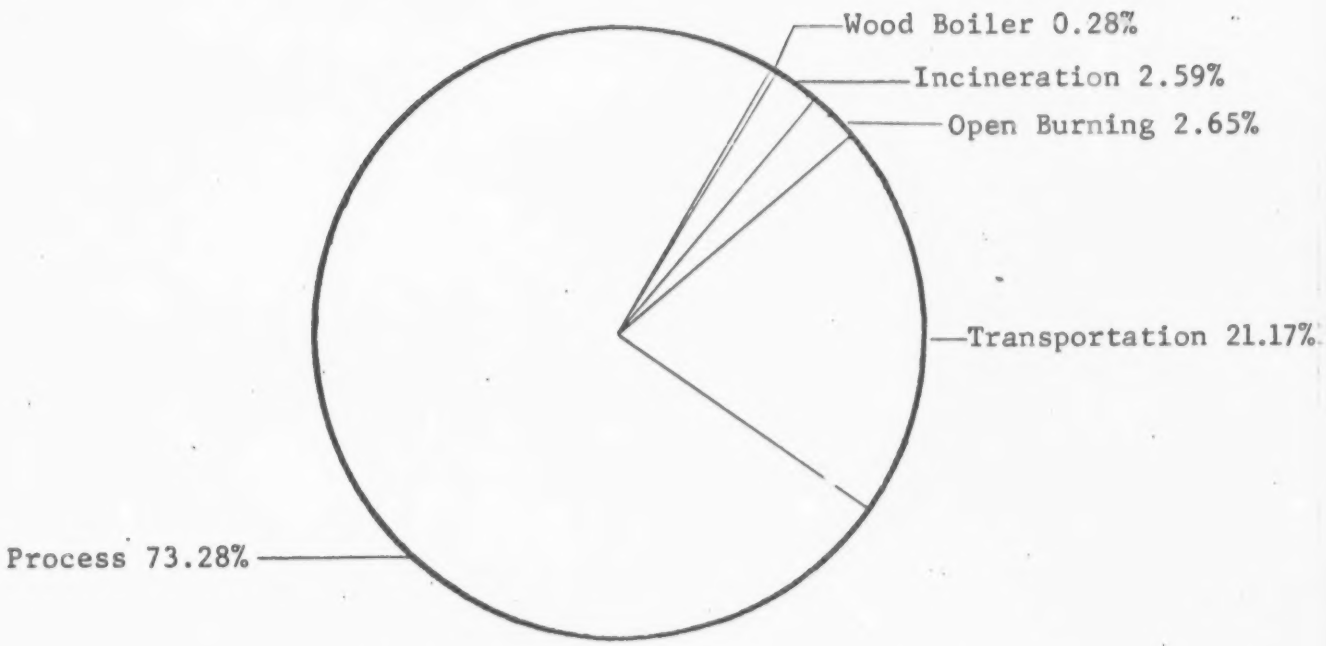
REGION 19

SUMMARY OF CARBON MONOXIDE EMISSIONS

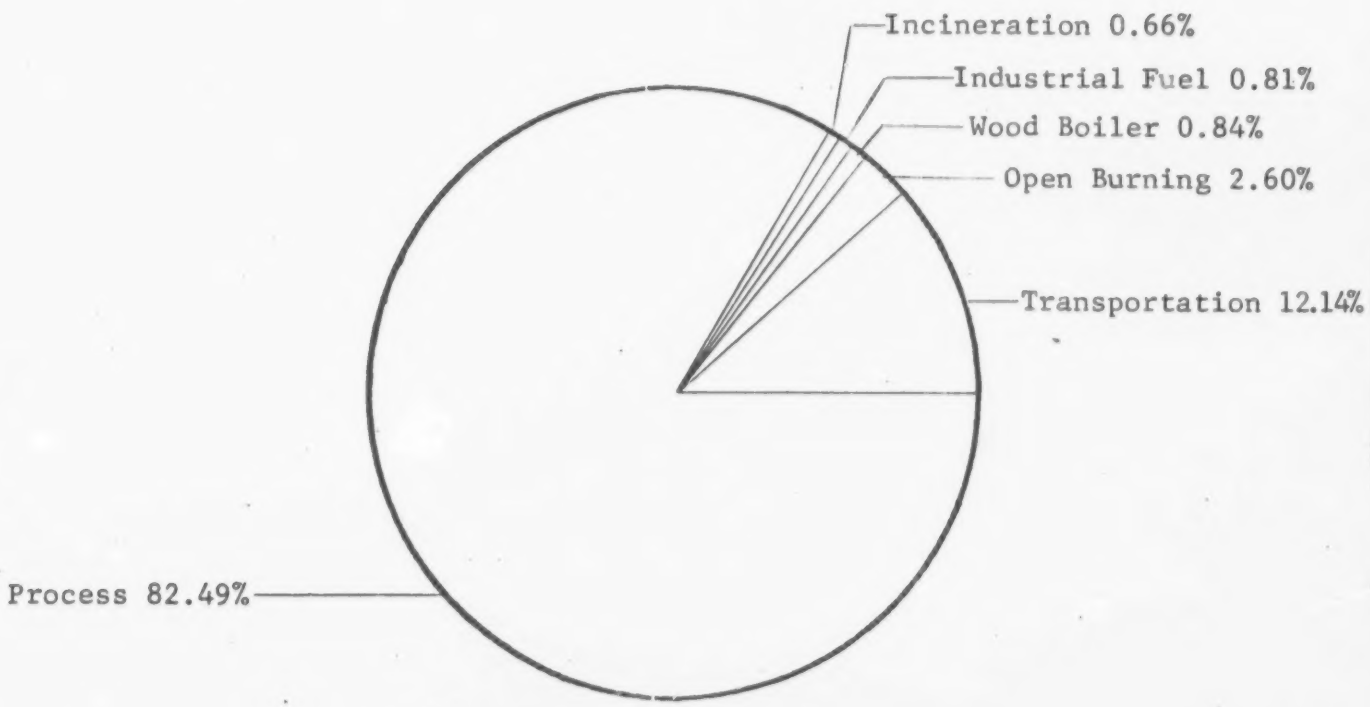


Omitted Emission Sources:

Residential Fuel	0.02%
Com. & Inst. Fuel	0.01%
Industrial Fuel	0.00%
Power Plants	0.00%
Miscellaneous	0.00%

REGION 19

SUMMARY OF HYDROCARBON EMISSIONS

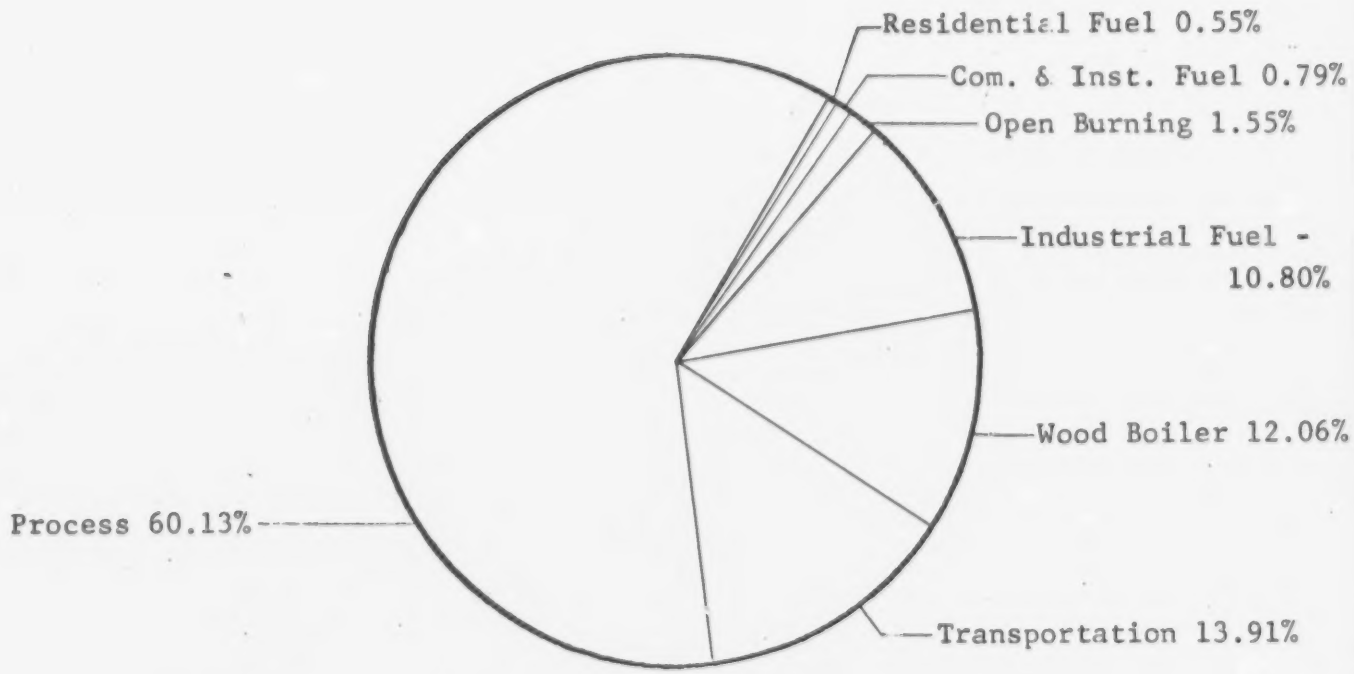


Omitted Emission Sources:

Residential Fuel	0.02%
Com. & Inst. Fuel	0.02%
Power Plants	0.00%
Miscellaneous	0.19%

REGION 19

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Power Plants	0.00%
Incineration	0.18%
Miscellaneous	0.00%

EMISSIONS INVENTORY SUMMARY

AQCR 020 Arkansas 1970

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Distillate Oil	0	0	0	0	0	------	-----
3. Natural Gas	215	7	226	90	848	22,612	MMCF
4. Wood	0	0	0	0	0	------	-----
5. Total	215	7	226	90	848	------	-----
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
2. Coke - Point Source	0	0	0	0	0	------	-----
3. Distillate Oil							
a. Area Source	120	311	2	24	480	16,009	10^3 gal
b. Point Source	1	3	0	0	2	80	10^3 gal
4. Residual Oil							
a. Area Source	100	2,147	1	13	259	8,656	10^3 gal
b. Point Source	0	0	0	0	0	------	-----
5. Natural Gas							
a. Area Source	912	30	142	1,815	8,191	100,667	MMCF
b. Point Source	188	6	4	417	1,824	20,865	MMCF
6. Process Gas-Point S.	0	0	0	0	0	------	-----
7. Wood							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	------	-----
9. Total	1,321	2,497	149	2,269	10,756	------	-----
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Bituminous Coal	0	0	0	0	0	------	-----
3. Distillate Oil	0	0	0	0	0	------	-----
4. Residual Oil	40	1,907	0	25	527	10,038	MMCF
5. Natural Gas	407	16	11	1,086	10,588	54,298	MMCF
6. Total	447	1,923	11	1,111	11,115	------	-----

3. Natural Gas	215	7	226	90	848	22,612	MMCF
4. Wood	0	0	0	0	0	------	-----
5. Total	215	7	226	90	848	------	-----
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
2. Coke - Point Source	0	0	0	0	0	------	-----
3. Distillate Oil							
a. Area Source	120	311	2	24	480	16,009	10^3 gal
b. Point Source	1	3	0	0	2	80	10^3 gal
4. Residual Oil							
a. Area Source	100	2,147	1	13	259	8,656	10^3 gal
b. Point Source	0	0	0	0	0	------	-----
5. Natural Gas							
a. Area Source	912	30	142	1,815	8,191	100,667	MMCF
b. Point Source	188	6	4	417	1,824	20,865	MMCF
6. Process Gas-Point S.	0	0	0	0	0	------	-----
7. Wood							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	------	-----
9. Total	1,321	2,497	149	2,269	10,756	------	-----
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Bituminous Coal	0	0	0	0	0	------	-----
3. Distillate Oil	0	0	0	0	0	------	-----
4. Residual Oil	40	1,907	0	25	527	10,038	MMCF
5. Natural Gas	407	16	11	1,086	10,588	54,298	MMCF
6. Total	447	1,923	11	1,111	11,115	------	-----
D. Total Fuel Combustion	1,983	4,427	386	3,470	22,719	------	-----

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	------	-----
B. Point Source	19,394	66	1,007	13,052	187	------	-----
III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	135	3	1,476	144	17	2,499	Tons
2. Municipal-Point S.	68	8	5	5	25	------	-----
B. Open Burning							
1. On Site							
a. Area Source	2,872	179	15,257	5,385	1,077	358,998	Tons
b. Point Source	187	11	400	68	51	7,817	Tons
2. Dumps							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	574	36	3,057	1,079	216	64,242	Tons
C. Boiler (wood)	257	19	20	20	94	------	-----
D. Total	4,093	256	20,215	6,701	1,480	------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	1,084	813	185,357	25,112	10,207	180,660	10^3 gal
2. Diesel	128	251	1,820	347	2,035	11,583	10^3 gal
B. Off Highway	0	0	0	0	0	------	-----
C. Aircraft	57	49	294	239	57	------	-----
D. Railroad	150	245	369	833	1,353	12,240	10^3 gal
E. Vessels	1	16	2	2	3	69	10^3 gal
F. Gasoline Handling	0	0	0	8,672	0	180,660	10^3 gal
G. Other	0	0	0	0	0	------	-----
H. Total	1,420	1,374	187,842	35,205	13,660	------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	------	-----
B. Dry Cleaning	0	0	0	521	0	------	-----
C. Total	0	0	0	521	0	------	-----

III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	135	3	1,476	144	17	2,499	Tons
2. Municipal-Point S.	68	8	5	5	25	------	-----
B. Open Burning							
1. On Site							
a. Area Source	2,872	179	15,257	5,385	1,077	358,998	Tons
b. Point Source	187	11	400	68	51	7,817	Tons
2. Dumps							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	574	36	3,057	1,079	216	64,242	Tons
C. Boiler (wood)	257	19	20	20	94	------	-----
D. Total	4,093	256	20,215	6,701	1,480	------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	1,084	813	185,357	25,112	10,207	180,660	10^3 gal
2. Diesel	128	251	1,820	347	2,035	11,583	10^3 gal
B. Off Highway	0	0	0	0	0	------	-----
C. Aircraft	57	49	294	239	57	------	-----
D. Railroad	150	245	369	833	1,358	12,240	10^3 gal
E. Vessels	1	16	2	2	3	69	10^3 gal
F. Gasoline Handling	0	0	0	8,672	0	180,660	10^3 gal
G. Other	0	0	0	0	0	------	-----
H. Total	1,420	1,374	187,842	35,205	13,660	------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	------	-----
B. Dry Cleaning	0	0	0	521	0	------	-----
C. Total	0	0	0	521	0	------	-----
VI. GRAND TOTAL							
A. Area Source	5,639	4,048	203,470	43,053	24,515	------	-----
B. Point Source	21,251	2,075	5,980	15,896	13,531	------	-----
C. Total	26,890	6,123	209,450	58,949	38,046	------	-----

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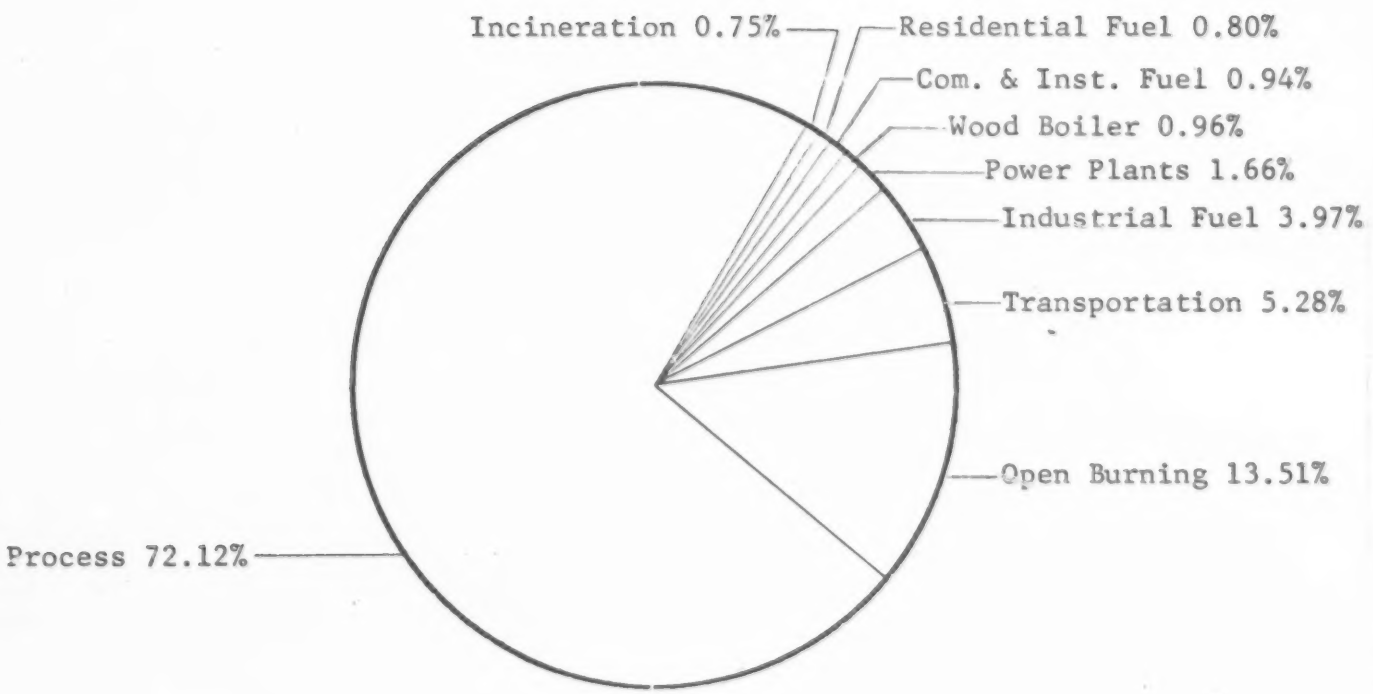
REGION 20

SUMMARY OF PARTICULATE EMISSIONS

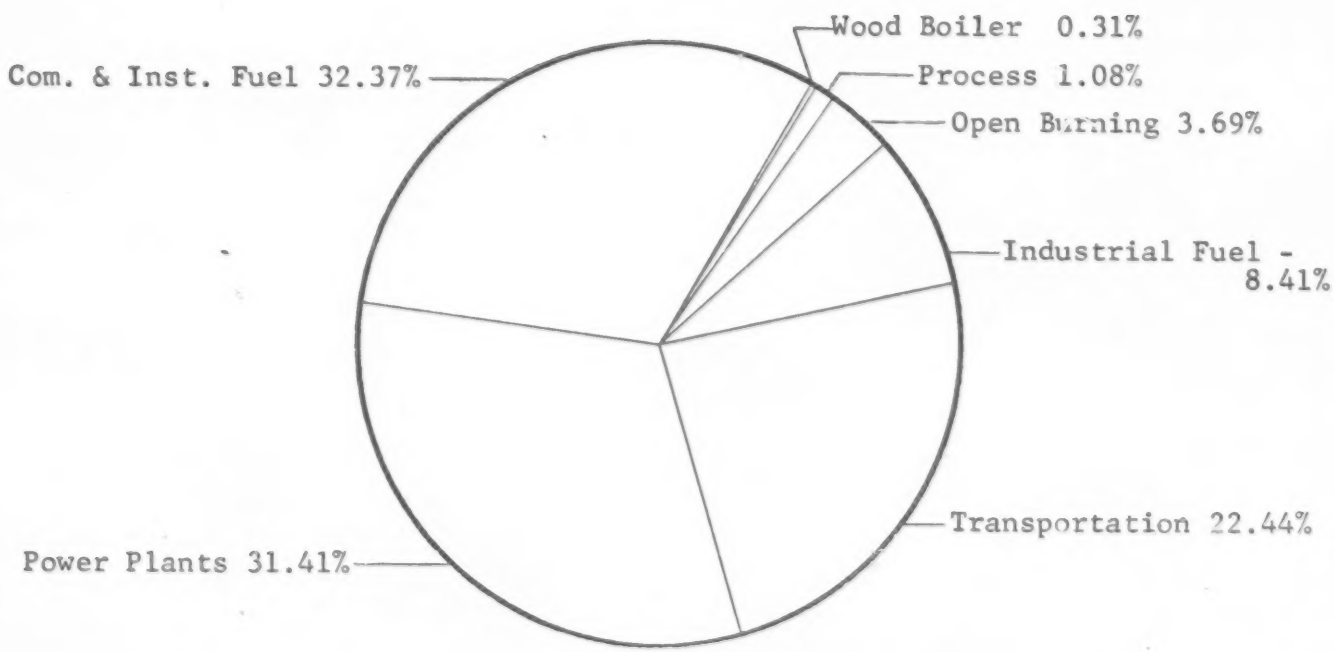


Omitted Emission Sources:

Miscellaneous	0.00%

REGION 20

SUMMARY OF SULFUR DIOXIDE EMISSIONS

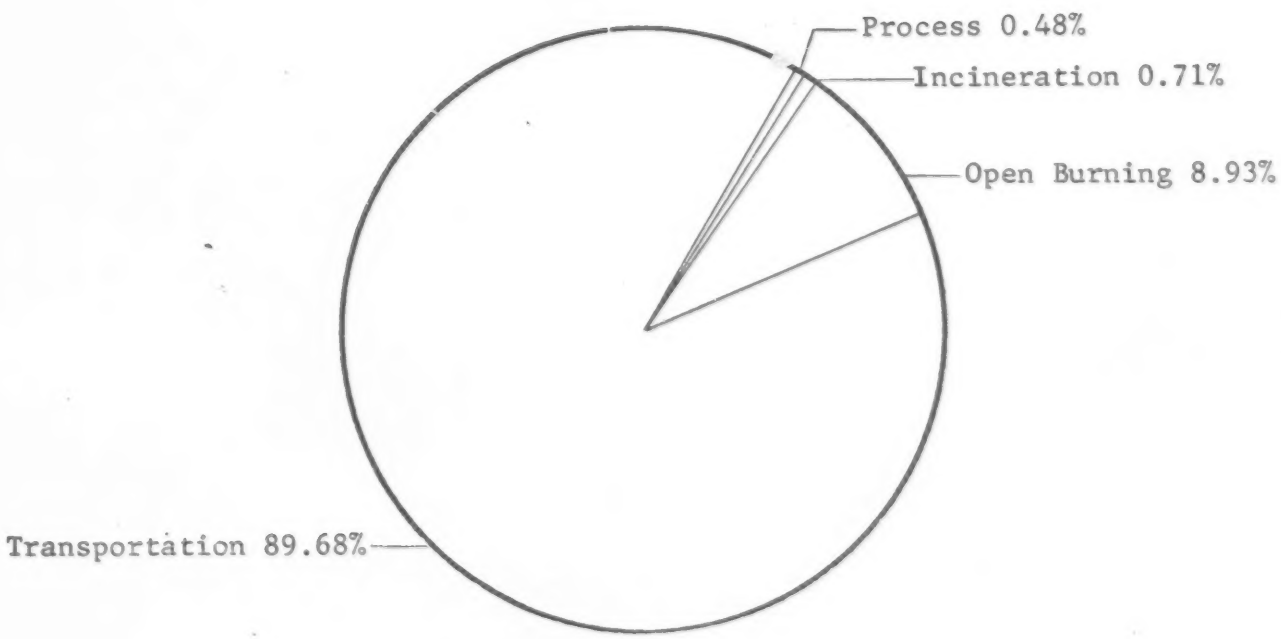


Omitted Emission Sources:

Residential Fuel	0.11%
Incineration	0.18%
Miscellaneous	0.00%

REGION 20

SUMMARY OF CARBON MONOXIDE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.11%
Com. & Inst. Fuel	0.06%
Industrial Fuel	0.01%
Power Plants	0.01%
Wood Boiler	0.01%
Miscellaneous	0.00%

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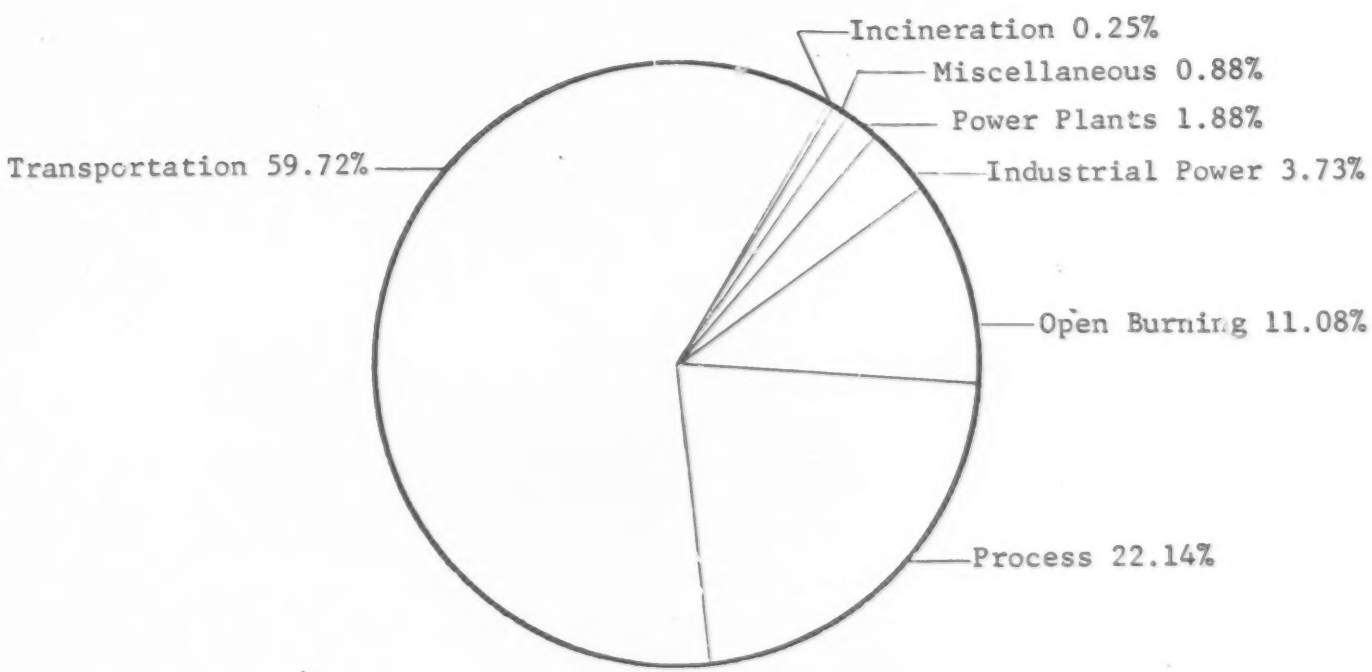
REGION 20

SUMMARY OF HYDROCARBON EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.15%
Com. & Inst. Fuel	0.12%
Wood Boiler	0.03%

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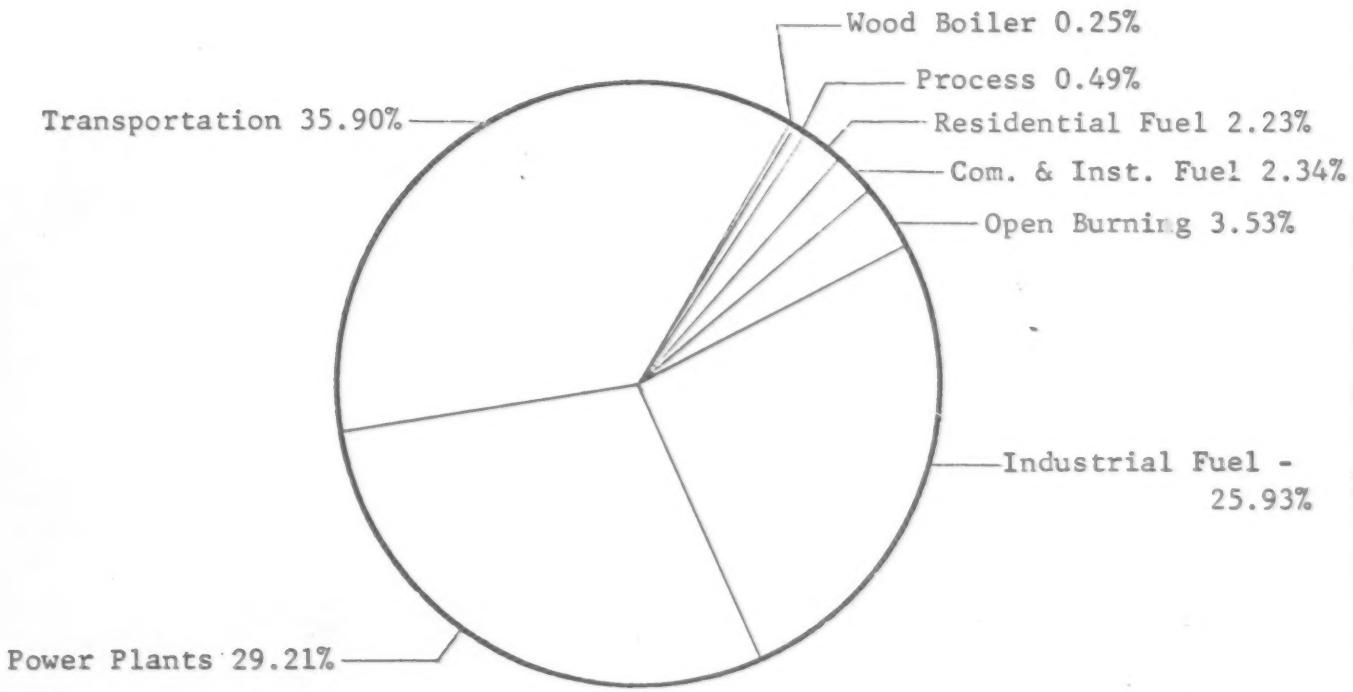
REGION 20

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Incineration	0.11%
Miscellaneous	0.00%

EMISSIONS INVENTORY SUMMARY

AQCR 021 Arkansas 1970

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_x	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Distillate Oil	0	0	0	0	0	------	-----
3. Natural Gas	44	1	46	19	174	4,633	MMCF
4. Wood	0	0	0	0	0	------	-----
5. Total	44	1	46	19	174	------	-----
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
2. Coke - Point Source	0	0	0	0	0	------	-----
3. Distillate Oil							
a. Area Source	44	114	0	9	176	5,856	10^3 gal
b. Point Source	1	25	0	0	5	151	10^3 gal
4. Residual Oil							
a. Area Source	36	788	0	5	95	3,174	10^3 gal
b. Point Source	29	0	0	4	76	2,528	10^3 gal
5. Natural Gas							
a. Area Source	52	2	27	70	362	5,633	MMCF
b. Point Source	2	0	0	4	19	220	MMCF
6. Process Gas-Point S.	0	0	0	0	0	------	-----
7. Wood							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	------	-----
9. Total	164	929	27	92	733	------	-----
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Bituminous Coal	0	0	0	0	0	------	-----
3. Distillate Oil	0	0	0	0	0	------	-----
4. Residual Oil	0	0	0	0	0	------	-----
5. Natural Gas	14	1	0	37	363	1,863	MMCF
6. Total	14	1	0	37	363	------	-----

1. Anthracite Coal	0	0	0	0	0	------	-----
2. Distillate Oil	0	0	0	0	0	------	-----
3. Natural Gas	44	1	46	19	174	4,633	MMCF
4. Wood	0	0	0	0	0	------	-----
5. Total	44	1	46	19	174	------	-----
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
2. Coke - Point Source	0	0	0	0	0	------	-----
3. Distillate Oil							
a. Area Source	44	114	0	9	176	5,856	10^3 gal
b. Point Source	1	25	0	0	5	151	10^3 gal
4. Residual Oil							
a. Area Source	36	788	0	5	95	3,174	10^3 gal
b. Point Source	29	0	0	4	76	2,528	10^3 gal
5. Natural Gas							
a. Area Source	52	2	27	70	362	5,633	MMCF
b. Point Source	2	0	0	4	19	220	MMCF
6. Process Gas-Point S.	0	0	0	0	0	------	-----
7. Wood							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	------	-----
9. Total	164	929	27	92	733	------	-----
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Bituminous Coal	0	0	0	0	0	------	-----
3. Distillate Oil	0	0	0	0	0	------	-----
4. Residual Oil	0	0	0	0	0	------	-----
5. Natural Gas	14	1	0	37	363	1,863	MMCF
6. Total	14	1	0	37	363	------	-----
D. Total Fuel Combustion	222	931	73	148	1,270	------	-----

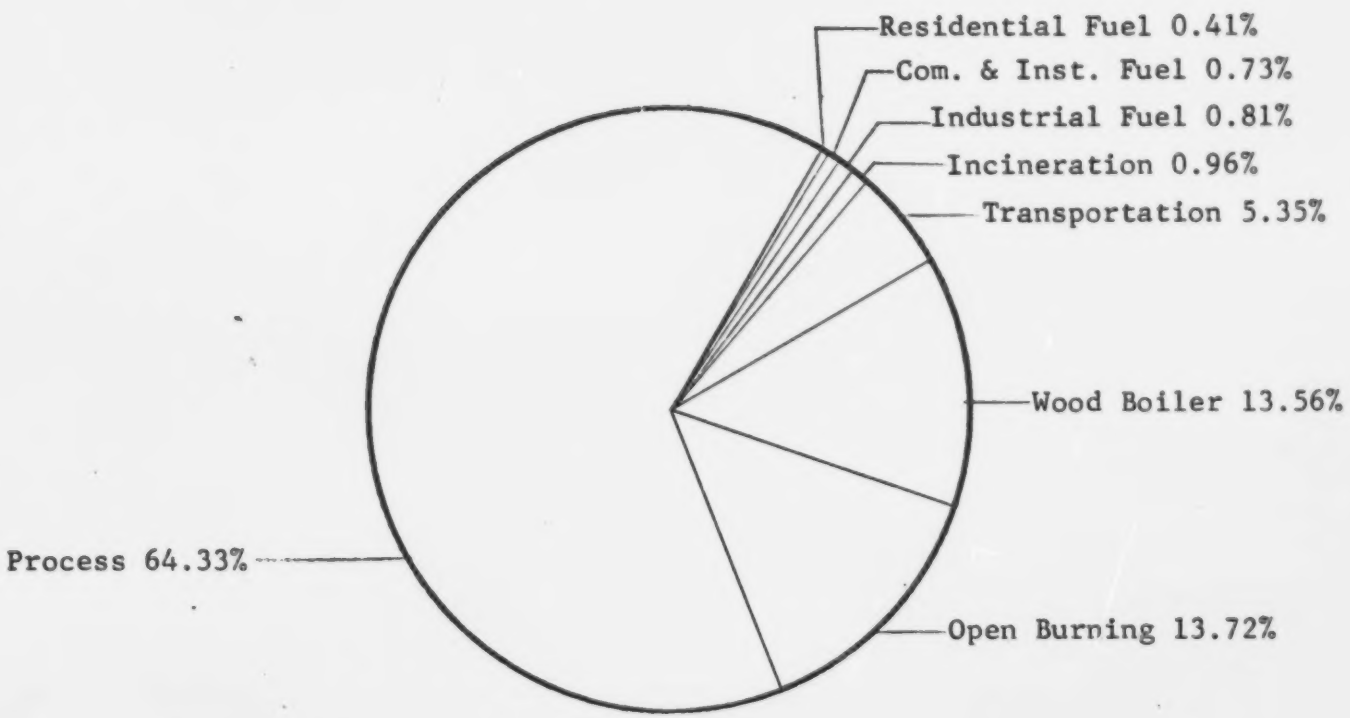
Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	------	-----
B. Point Source	6,867	0	4,801	1,559	0	------	-----
II. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	102	0	1,930	165	14	------	-----
2. Municipal-Point S.	0	0	0	0	0	------	-----
B. Open Burning							
1. On Site							
a. Area Source	1,261	79	6,697	2,363	473	157,565	Tons
b. Point Source	157	2	542	91	26	------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	47	3	250	88	18	5,871	Tons
C. Boiler (wood)	1,448	79	105	105	527	------	-----
D. Total	3,015	163	9,524	2,812	1,058	------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	470	352	80,295	10,878	4,422	78,260	10^3 gal
2. Diesel	50	103	783	144	874	4,808	10^3 gal
B. Off Highway	0	0	0	0	0	------	-----
C. Aircraft	0	0	0	0	0	------	-----
D. Railroad	48	80	124	277	450	4,104	10^3 gal
E. Vessels	3	52	8	6	8	232	10^3 gal
F. Gasoline Handling	0	0	0	3,756	0	78,260	10^3 gal
G. Other	0	0	0	0	0	------	-----
H. Total	571	587	81,210	15,061	5,754	------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	------	-----
B. Dry Cleaning	0	0	0	214	0	------	-----
C. Total	0	0	0	214	0	------	-----

II. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	102	0	1,930	165	14	------	-----
2. Municipal-Point S.	0	0	0	0	0	------	-----
B. Open Burning							
1. On Site							
a. Area Source	1,261	79	6,697	2,363	473	157,565	Tons
b. Point Source	157	2	542	91	26	------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	47	3	250	88	18	5,871	Tons
C. Boiler (wood)	1,448	79	105	105	527	------	-----
D. Total	3,015	163	9,524	2,812	1,058	------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	470	352	80,295	10,878	4,422	78,260	10^3 gal
2. Diesel	50	103	783	144	874	4,808	10^3 gal
B. Off Highway	0	0	0	0	0	------	-----
C. Aircraft	0	0	0	0	0	------	-----
D. Railroad	48	80	124	277	450	4,104	10^3 gal
E. Vessels	3	52	8	6	8	232	10^3 gal
F. Gasoline Handling	0	0	0	3,756	0	78,260	10^3 gal
G. Other	0	0	0	0	0	------	-----
H. Total	571	587	81,210	15,061	5,754	------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	------	-----
B. Dry Cleaning	0	0	0	214	0	------	-----
C. Total	0	0	0	214	0	------	-----
VI. GRAND TOTAL							
A. Area Source	2,008	1,571	87,980	17,741	7,034	------	-----
B. Point Source	8,667	110	7,628	2,053	1,048	------	-----
C. Total	10,675	1,681	95,608	19,794	8,082	------	-----

Radian Corporation 8500 SHOALCREEK BLVD. • P. O. BOX 9948 • AUSTIN, TEXAS 78758 • TELEPHONE 512 - 454-4797

REGION 21

SUMMARY OF PARTICULATE EMISSIONS



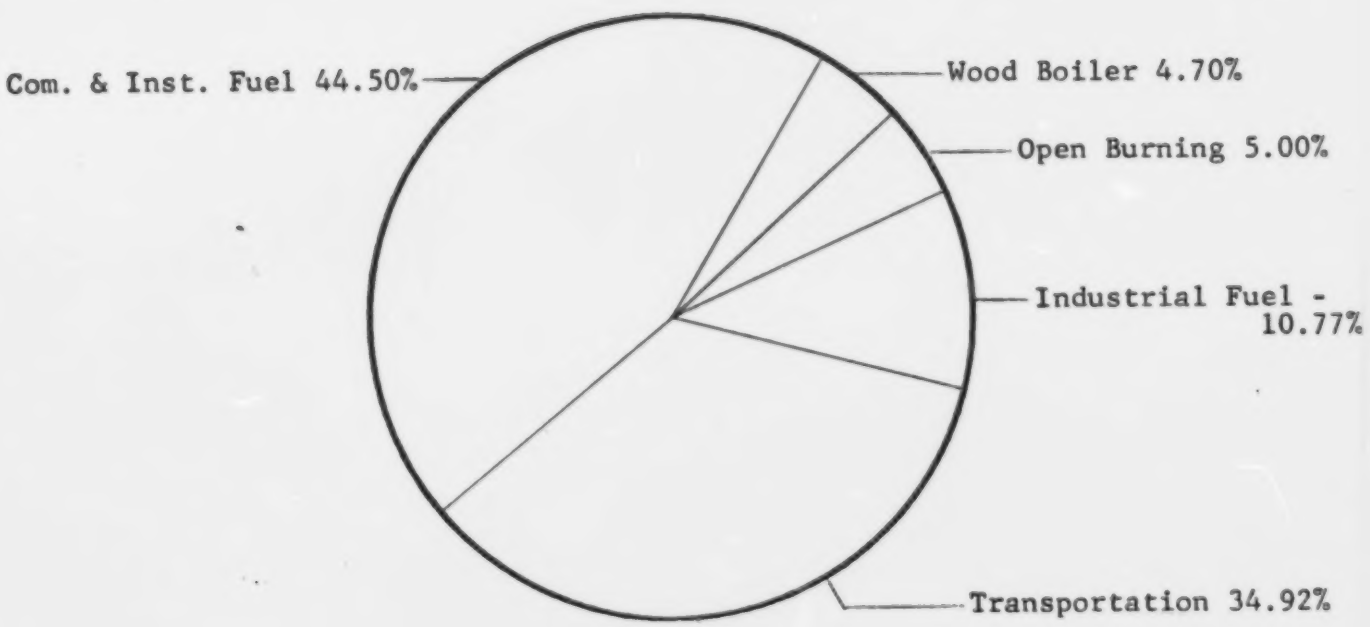
Omitted Emission Sources:

Power Plants	0.13%
Miscellaneous	0.00%

Radian Corporation 8500 SHOALCREEK BLVD. • P. O. BOX 9948 • AUSTIN, TEXAS 78758 • TELEPHONE 512 - 454-4535

REGION 21

SUMMARY OF SULFUR DIOXIDE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.06%
Power Plants	0.06%
Process	0.00%
Incineration	0.00%
Miscellaneous	0.00%

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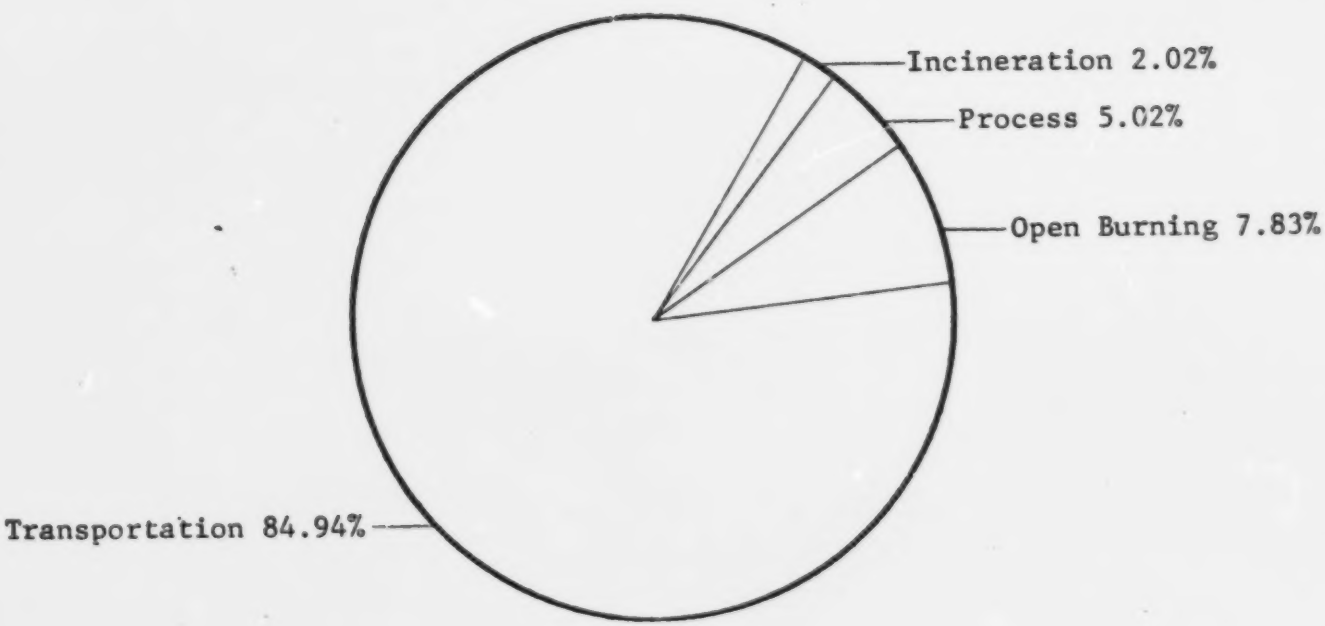
REGION 21

SUMMARY OF CARBON MONOXIDE EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.05%
Com. & Inst. Fuel	0.03%
Industrial Fuel	0.00%
Power Plants	0.00%
Wood Boiler	0.11%
Miscellaneous	0.00%

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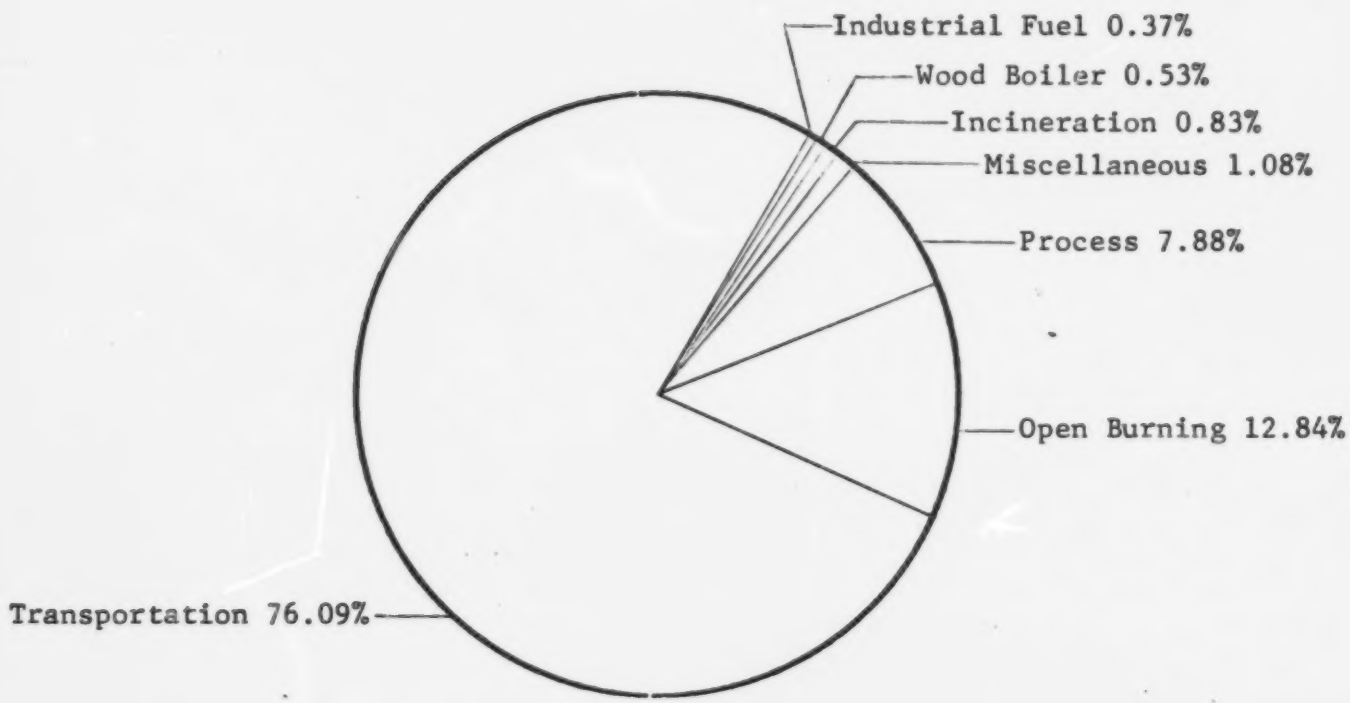
REGION 21

SUMMARY OF HYDROCARBON EMISSIONS



Omitted Emission Sources:

Residential Fuel	0.09%
Com. & Inst. Fuel	0.09%
Power Plants	0.19%

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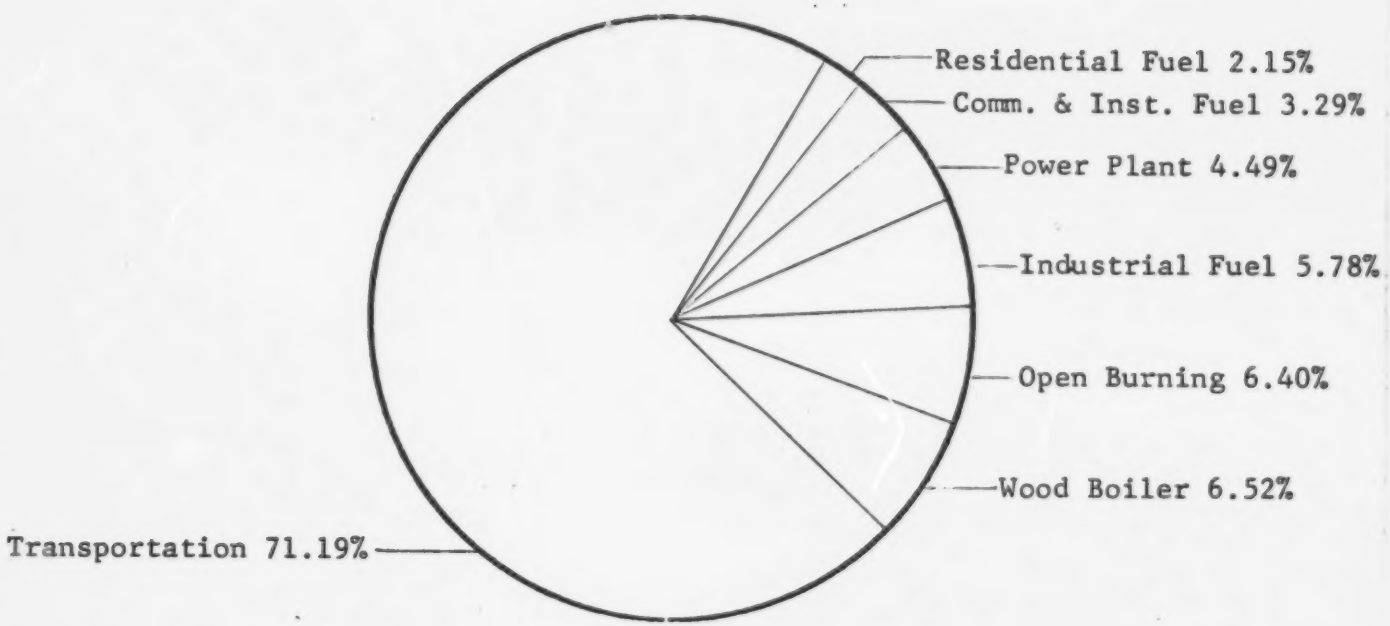
REGION 21

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Process	0.00%
Incineration	0.17%
Miscellaneous	0.00%

EMISSIONS INVENTORY SUMMARY

AQCR 022 Arkansas 1970

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_x	CO	HC	NO_x	Quantity	Units
I. FUEL COMBUSTION							
A. Residential Fuel Area S.							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Distillate Oil	0	0	0	0	0	------	-----
3. Natural Gas	34	1	36	14	135	3,597	MMCF
4. Wood	0	0	0	0	0	------	-----
5. Total	34	1	36	14	135	------	-----
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
2. Coke - Point Source	0	0	0	0	0	------	-----
3. Distillate Oil							
a. Area Source	40	105	0	8	162	5,385	10^3 gal
b. Point Source	1	0	0	0	3	100	10^3 gal
4. Residual Oil							
a. Area Source	35	753	0	5	91	3,033	10^3 gal
b. Point Source	1	0	0	0	4	130	10^3 gal
5. Natural Gas							
a. Area Source	191	7	21	397	1,770	21,205	MMCF
b. Point Source	34	1	1	75	329	3,765	MMCF
6. Process Gas-Point S.	0	0	0	0	0	------	-----
7. Wood							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	------	-----
9. Total	302	866	22	485	2,359	------	-----
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Bituminous Coal	0	0	0	0	0	------	-----
3. Distillate Oil	0	0	0	0	0	------	-----
4. Residual Oil	5	168	0	2	37	781	10^3 gal

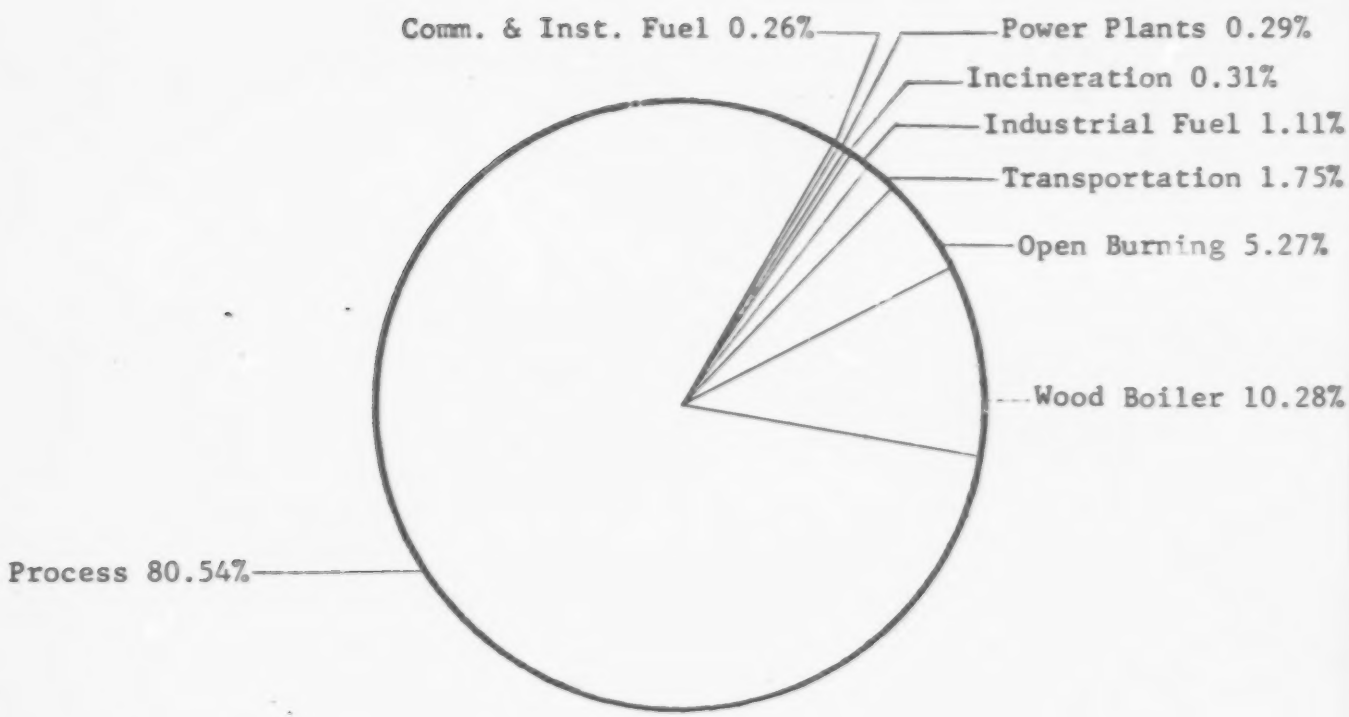
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Distillate Oil	0	0	0	0	0	------	-----
3. Natural Gas	34	1	36	14	135	3,597	MMCF
4. Wood	0	0	0	0	0	------	-----
5. Total	34	1	36	14	135	------	-----
B. Comm.-Instl. & Ind. Fuel							
1. Bituminous Coal							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
2. Coke - Point Source	0	0	0	0	0	------	-----
3. Distillate Oil							
a. Area Source	40	105	0	8	162	5,385	10^3 gal
b. Point Source	1	0	0	0	3	100	10^3 gal
4. Residual Oil							
a. Area Source	35	753	0	5	91	3,033	10^3 gal
b. Point Source	1	0	0	0	4	130	10^3 gal
5. Natural Gas							
a. Area Source	191	7	21	397	1,770	21,205	MMCF
b. Point Source	34	1	1	75	329	3,765	MMCF
6. Process Gas-Point S.	0	0	0	0	0	------	-----
7. Wood							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	0	0	0	0	0	------	-----
8. Other							
a. Natural Gas Engines	0	0	0	0	0	------	-----
9. Total	302	866	22	485	2,359	------	-----
C. Steam-Electric Power Plants							
1. Anthracite Coal	0	0	0	0	0	------	-----
2. Bituminous Coal	0	0	0	0	0	------	-----
3. Distillate Oil	0	0	0	0	0	------	-----
4. Residual Oil	5	168	0	2	37	781	10^3 gal
5. Natural Gas	60	2	2	160	1,556	8,020	MMCF
6. Total	65	170	2	162	1,593	------	-----
D. Total Fuel Combustion	401	1,037	60	661	4,087	------	-----

Source Category	Tons of Pollutant/Year					Fuel, Etc.	
	Part	SO_2	CO	HC	NO_x	Quantity	Units
II. PROCESS LOSSES							
A. Area Source	0	0	0	0	0	------	-----
B. Point Source	17,659	5,532	0	562	0	------	-----
III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	68	0	1,077	91	9	------	-----
2. Municipal-Point S.	0	0	0	0	0	------	-----
B. Open Burning							
1. On Site							
a. Area Source	694	43	3,686	1,301	260	86,727	Tons
b. Point Source	262	0	772	62	32	------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	201	13	1,066	377	76	25,092	Tons
C. Boiler (wood)	2,255	125	165	165	828	------	-----
D. Total	3,480	181	6,766	1,996	1,205	------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	284	213	48,558	6,578	2,674	47,327	10^3 gal
2. Diesel	33	65	476	91	532	3,031	10^3 gal
B. Off Highway	0	0	0	0	0	------	-----
C. Aircraft	5	1	12	37	5	------	-----
D. Railroad	62	101	152	343	560	5,054	10^3 gal
E. Vessels	0	0	0	0	0	------	-----
F. Gasoline Handling	0	0	0	2,272	0	47,327	10^3 gal
G. Other	0	0	0	0	0	------	-----
H. Total	384	380	49,198	9,321	3,771	------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	------	-----
B. Dry Cleaning	0	0	0	135	0	------	-----
C. Total	0	0	0	135	0	------	-----

III. SOLID WASTE DISPOSAL							
A. Incineration							
1. On Site							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	68	0	1,077	91	9	------	-----
2. Municipal-Point S.	0	0	0	0	0	------	-----
B. Open Burning							
1. On Site							
a. Area Source	694	43	3,686	1,301	260	86,727	Tons
b. Point Source	262	0	772	62	32	------	-----
2. Dumps							
a. Area Source	0	0	0	0	0	------	-----
b. Point Source	201	13	1,066	377	76	25,092	Tons
C. Boiler (wood)	2,255	125	165	165	828	------	-----
D. Total	3,480	181	6,766	1,996	1,205	------	-----
IV. TRANSPORTATION - AREA SOURCE							
A. Motor Vehicles							
1. Gasoline	284	213	48,558	6,578	2,674	47,327	10^3 gal
2. Diesel	33	65	476	91	532	3,031	10^3 gal
B. Off Highway	0	0	0	0	0	------	-----
C. Aircraft	5	1	12	37	5	------	-----
D. Railroad	62	101	152	343	560	5,054	10^3 gal
E. Vessels	0	0	0	0	0	------	-----
F. Gasoline Handling	0	0	0	2,272	0	47,327	10^3 gal
G. Other	0	0	0	0	0	------	-----
H. Total	384	380	49,198	9,321	3,771	------	-----
V. MISCELLANEOUS							
A. Agricultural Burning	0	0	0	0	0	------	-----
B. Dry Cleaning	0	0	0	135	0	------	-----
C. Total	0	0	0	135	0	------	-----
VI. GRAND TOTAL							
A. Area Source	1,378	1,289	52,941	11,181	6,189	------	-----
B. Point Source	20,546	5,841	3,083	1,494	2,874	------	-----
C. Total	21,924	7,130	56,024	12,675	9,063	------	-----

REGION 22

SUMMARY OF PARTICULATE EMISSIONS



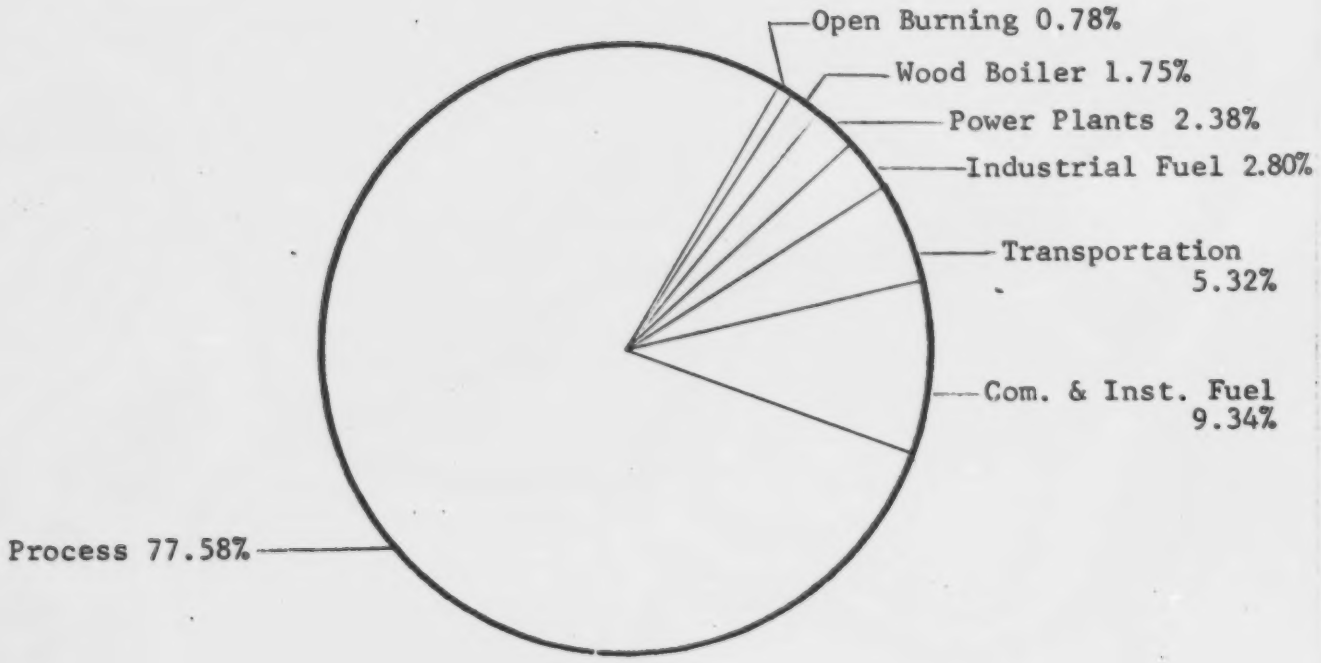
Omitted Emission Sources:

Residential Fuel	0.15%
Miscellaneous	0.00%

Radian Corporation 8500 SHOAL CREEK BLVD. • P. O. BOX 9948 • AUSTIN, TEXAS 78757 • TELEPHONE 512 - 454-4797

REGION 22

SUMMARY OF SULFUR DIOXIDE EMISSIONS

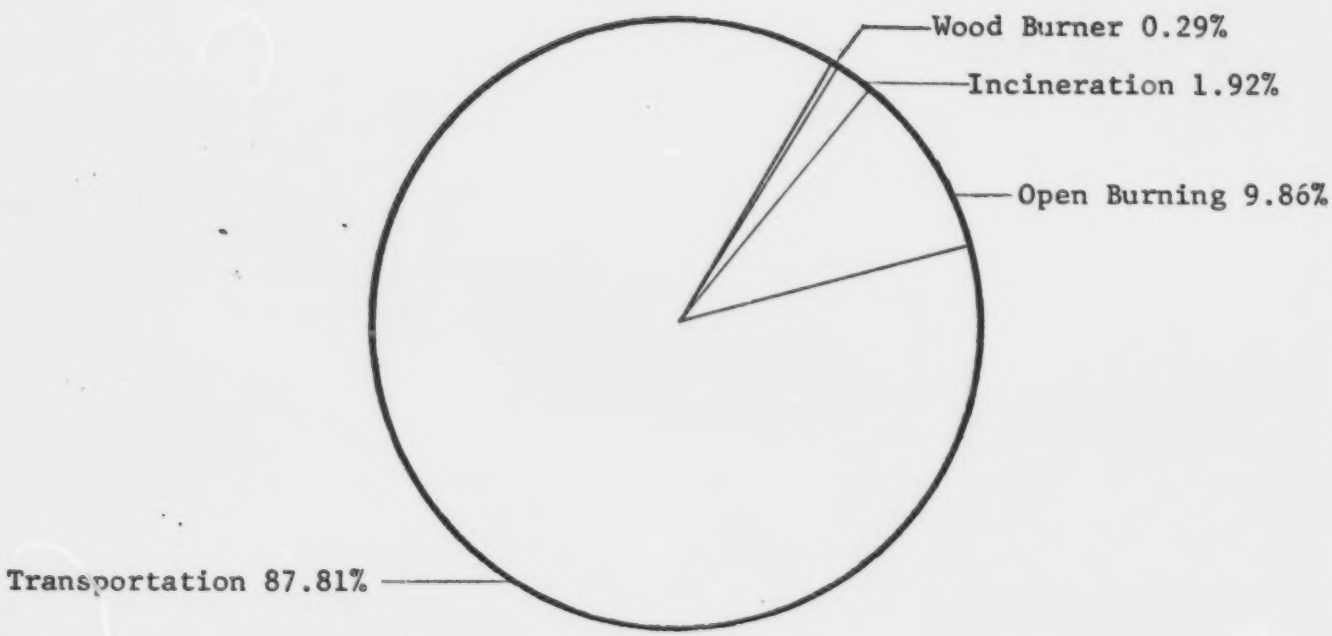


Omitted Emission Sources:

Residential Fuel	0.01%
Incineration	0.00%
Miscellaneous	0.00%

REGION 22

SUMMARY OF CARBON MONOXIDE EMISSIONS

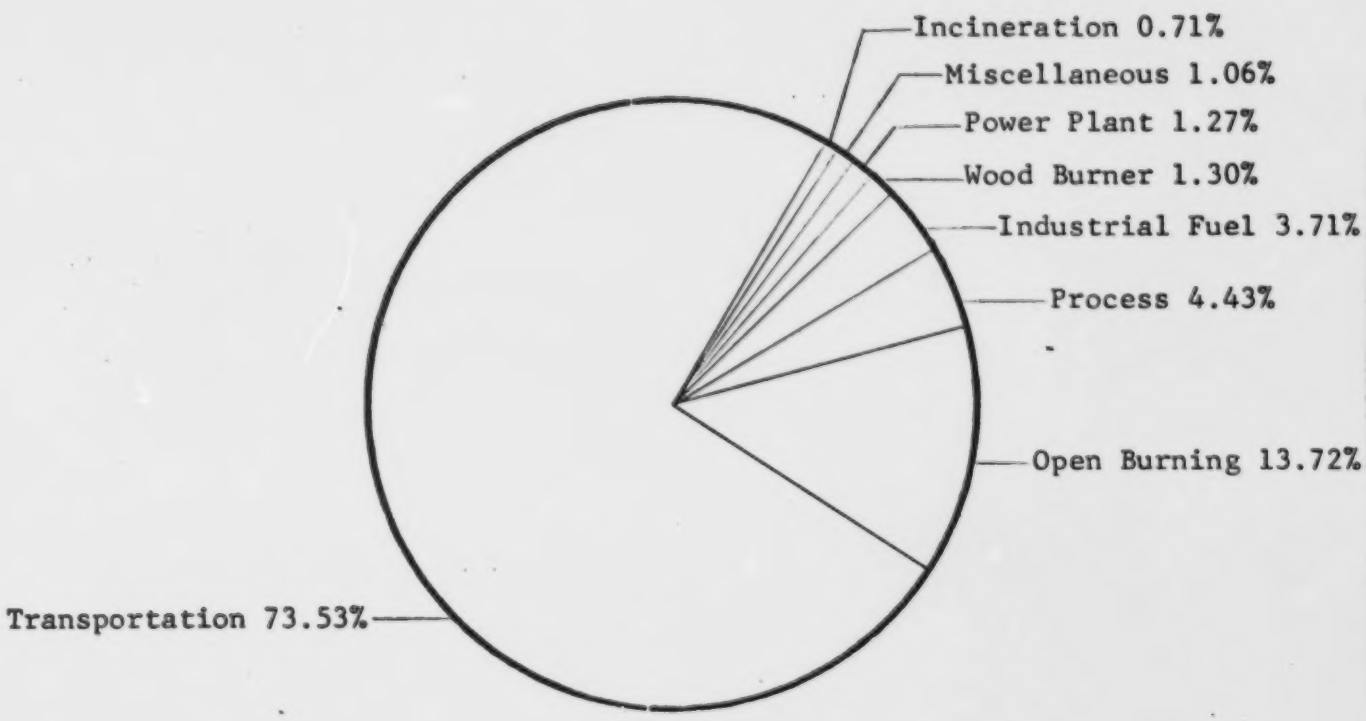


Omitted Emission Sources:

Residential Fuel	0.06%
Comm. & Inst. Fuel	0.03%
Industrial Fuel	0.00%
Power Plants	0.00%
Process	0.00%
Miscellaneous	0.00%

REGION 22

SUMMARY OF HYDROCARBON EMISSIONS

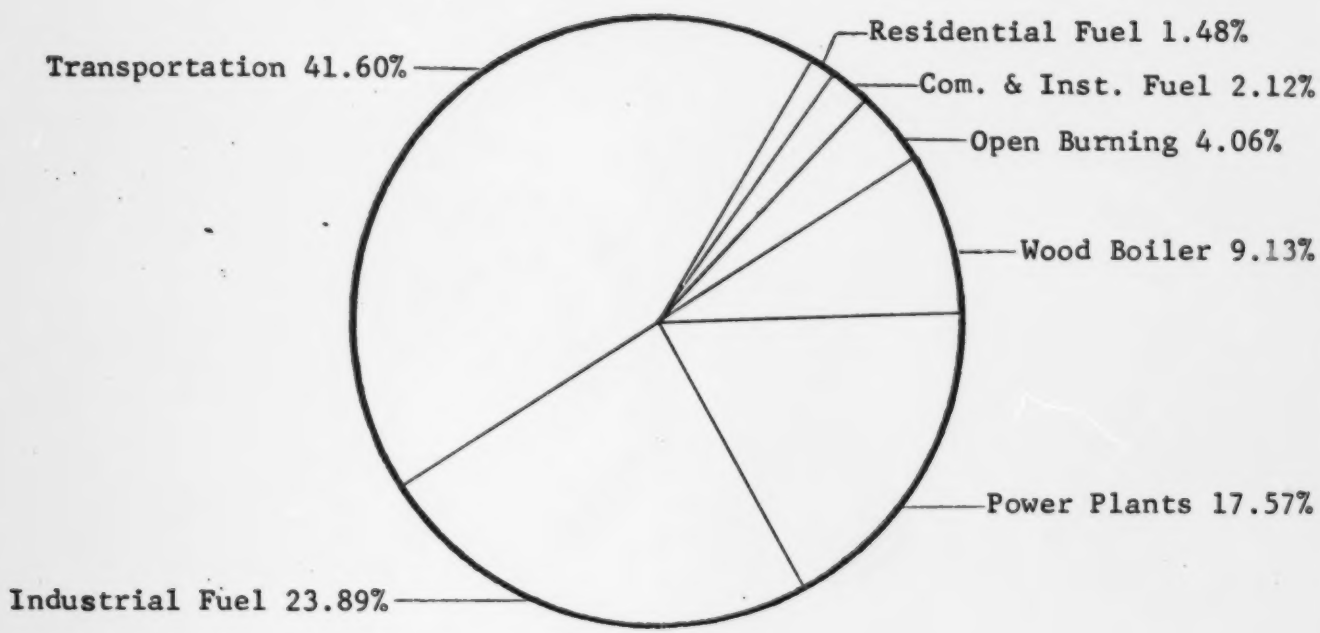


Omitted Emission Sources:

Residential Fuel	0.11%
Com. & Inst. Fuel	0.11%

REGION 22

SUMMARY OF NITROGEN OXIDE EMISSIONS



Omitted Emission Sources:

Process	0.00%
Incineration	0.09%
Miscellaneous	0.00%

APPENDIX III

Example of Status Book Information

ARKANSAS POLLUTION CONTROL COMMISSION

NAME AND ADDRESS	•	TYPE	•DATE REC	• QUESTIONNAIRE STATUS •	COMMENTS
CSN 310008 R1819	WU	WOOD PRODUCTS	05/01/71	COMPLETE-------YES-----	
NOEL DAVIS LUMBER CO				INCOMPLETE------------	
P O BOX 93				LETTER----------------	
MURFREESBORO , AR. 71958				APCO STATUS------------	
				OUT OF BUSINESS--------	
			05/15/71	NEGLIGIBLE------YES----	
				RECONTACT BY PHONE-----	
				RECONTACT BY LETTER----	
CSN 170010 R1820	W2	WOOD PRODUCTS		COMPLETE----------------	
NOLEN HANDLE CO.		RECONTACT		INCOMPLETE------------	
MOUNTAINBURG , AR. 72946				LETTER----------------	
				APCO STATUS------------	
				OUT OF BUSINESS--------	
			06/17/71	NEGLIGIBLE------YES----	
			06/16/71	RECONTACT BY PHONE-YES-	
				RECONTACT BY LETTER----	
CSN 560013 R1821	CO	COTTON GIN	05/01/71	COMPLETE-------YES-----	
NORCROSS MERCANTILE CO.				INCOMPLETE------------	
TYRONZA , AR. 72386				LETTER----------------	
				APCO STATUS------------	
				OUT OF BUSINESS--------	
				NEGLIGIBLE------------	
				RECONTACT BY PHONE-----	
				RECONTACT BY LETTER----	
CSN 030901 R1822	IO	MANUFACTURING	05/01/71	COMPLETE-------YES-----	
NORFORK ART METAL				INCOMPLETE------------	
BOX 97				LETTER----------------	
NORFORK , AR.				APCO STATUS------------	
				OUT OF BUSINESS--------	
			05/15/71	NEGLIGIBLE------YES----	
				RECONTACT BY PHONE-----	
				RECONTACT BY LETTER----	

ARKANSAS POLLUTION CONTROL COMMISSION

NAME AND ADDRESS	•	TYPE	•DATE REC	• QUESTIONNAIRE STATUS •	COMMENTS
CSN 260004 R1823 10		MANUFACTURING	05/01/71	COMPLETE-------YES-----	
NORRIS DISPENSERS INC				INCOMPLETE----------	
P O BOX 790				LETTER----------	
HOT SPRINGS , AR. 71901				APCO STATUS----------	
				OUT OF BUSINESS-------	
			06/24/71	NEGLIGIBLE------YES----	
				RECONTACT BY PHONE-----	
				RECONTACT BY LETTER----	
CSN 460003 R1824 12		MANUFACTURING		COMPLETE----------	
NORTH AMERICAN CAR CORP.		RECONTACT		INCOMPLETE----------	
P. O. BOX 580				LETTER----------	
TEXARKANA , AR.				APCO STATUS----------	
				OUT OF BUSINESS-------	
			06/11/71	NEGLIGIBLE------YES----	
			06/10/71	RECONTACT BY PHONE-YES-	
				RECONTACT BY LETTER----	
CSN 660003 R1825 11		MANUFACTURING	07/18/71	COMPLETE-------YES-----	
NORTH AMERICAN FOUNDRY COMPANY, INC.		NEW CONTACT	05/17/71	INCOMPLETE-----YES-----	
4721 ZERO STREET				LETTER----------	
FORT SMITH , AR. 72901				APCO STATUS----------	
				OUT OF BUSINESS-------	
				NEGLIGIBLE----------	
			05/21/71	RECONTACT BY PHONE-YES-	
				RECONTACT BY LETTER----	
CSN 450007 R1826 W1		WOOD PRODUCTS	07/19/71	COMPLETE-------YES-----	
NORTH ARKANSAS WOOD PRODUCTS, INC.		NEW CONTACT	05/20/71	INCOMPLETE-----YES-----	
P. O. BOX 181				LETTER----------	
YELLVILLE , AR. 72687				APCO STATUS----------	
				OUT OF BUSINESS-------	
				NEGLIGIBLE----------	
				RECONTACT BY PHONE-----	
				RECONTACT BY LETTER----	

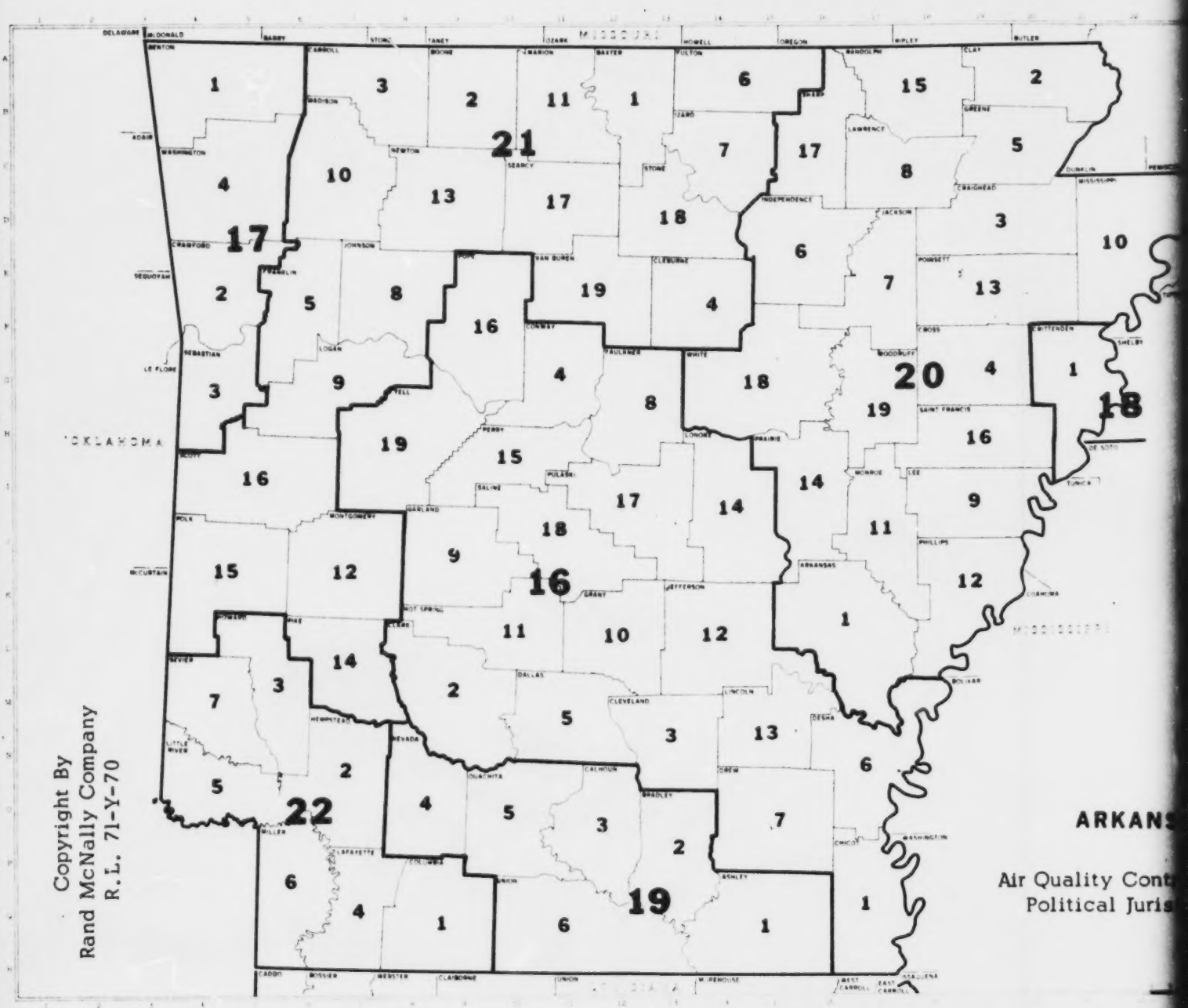
APPENDIX IV

Maps

A

Radian Corporation

Austin, Texas



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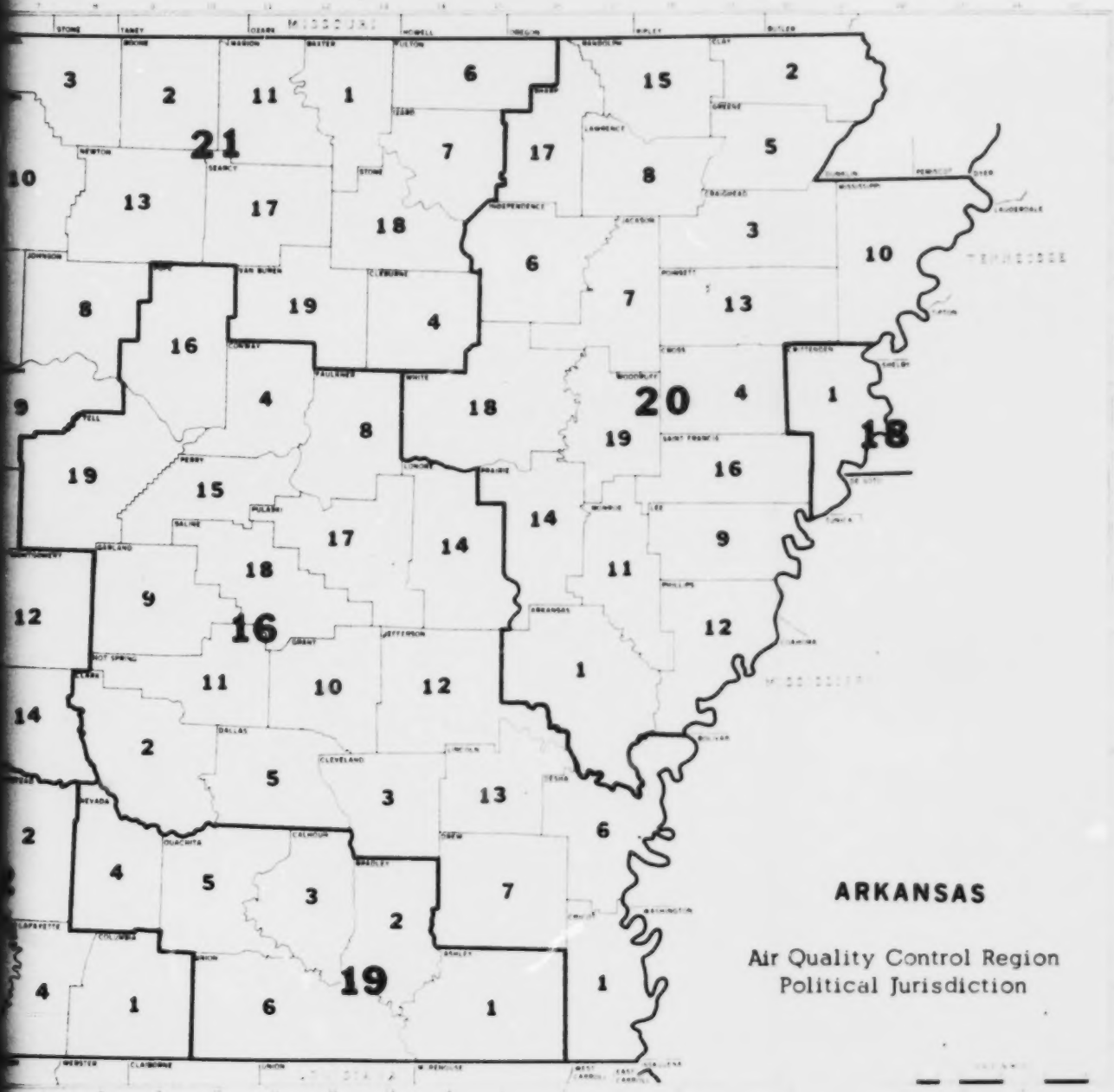
Air Quality Cont
Political Juris

B

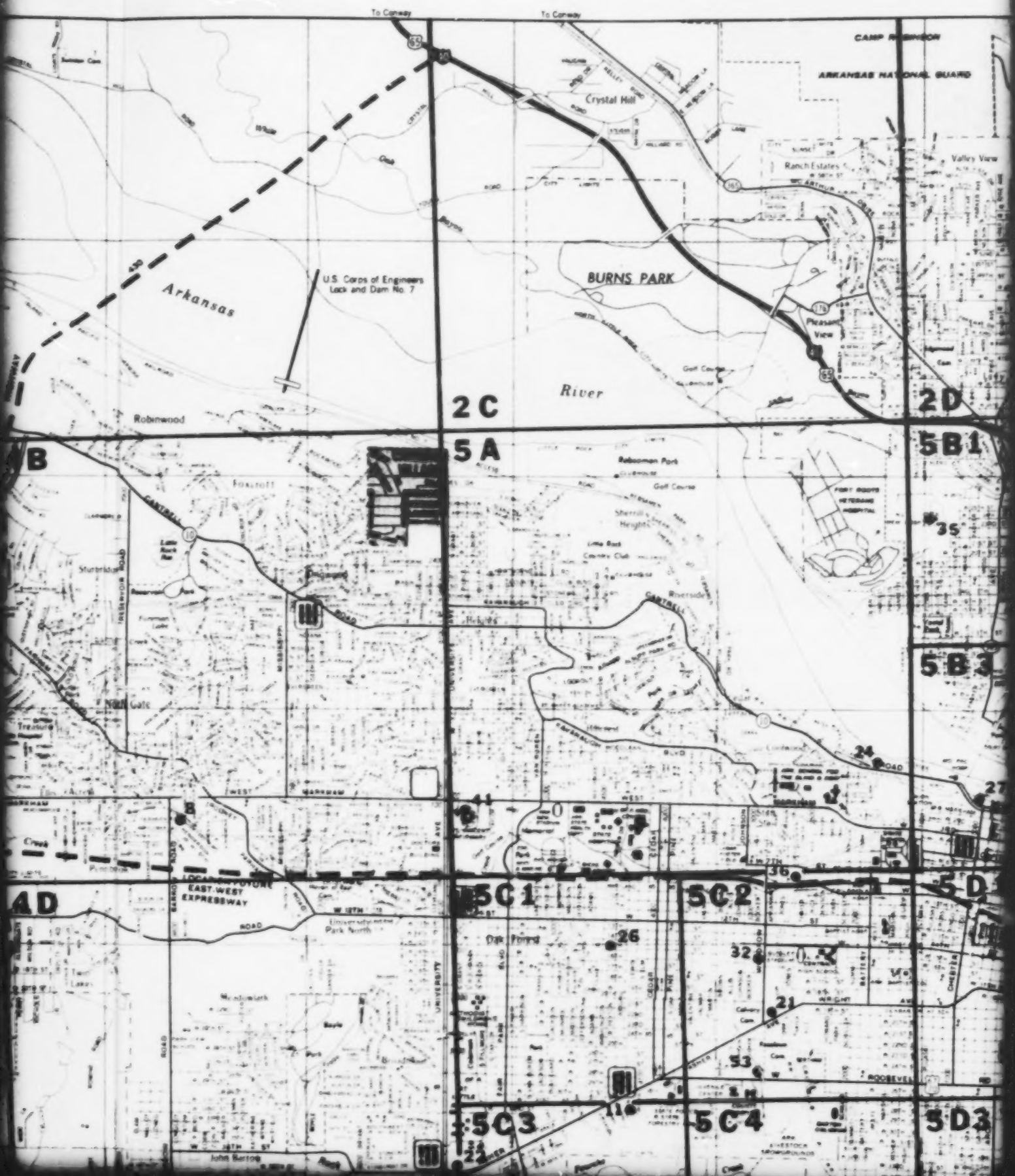
Radian Corporation
Austin, Texas

b



A

1
4A
4B
4C
4D
Ivesville
Pankey
Candlewood
Little Maumelle
Maumelle
Pulaski County Penal Farm
Walton Heights
Woodland Heights
Rubinwood
Pleasant Valley
Country Club
Arkansas
HIGHWAY
INTERSTATE
EAST-WEST EXPRESSWAY
COLONEL GLENN ROAD
Lake Alpine
Spring Valley
To Perryville


B
To Conway
To Conway
CAMP ROBINSON
ARKANSAS NATIONAL GUARD
Crystal Hill
Ranch Estates
Valley View
BURNS PARK
Arkansas
U.S. Corps of Engineers
Lock and Dam No. 7
River
Robinwood
Pleasant View
2C
2D
5A
5B1
5B3
5C1
5C2
5C3
5C4
5D3
AD
Forrest
Sherrill Heights
Little Rock Country Club
Riverside
Gate
Treasure
Park North
Dixie Pines
Mountainview
John Barrow
LOCAL-INTERSTATE EAST-WEST EXPRESSWAY
CANTRELL
ROOSEVELT
WEST
MARKHAM
UNIVERSITY
24
26
32
21
53
35
36
41

B

To Conway
To Conway
To N.L.R.
CAMP ROBINSON
ARKANSAS NATIONAL GUARD
Crystal Hill
Ranch Estates
Valley View
Arkansas
U.S. Corps of Engineers Lock and Dam No. 7
BURNS PARK
Pleasant View
River
Robinwood
2C
2D
5A
5B1
5B3
5C1
5C2
5D1
5C3
5C4
5D3
Foxcroft
Rebsamen Park
Golf Course
Sherrill Heights
Little Rock Country Club
Riverside
Gate
EAST-WEST EXPRESSWAY
University Park North
Oak Forest
Meadowlark
Boyle
Wright
Calvary Cem.
Roosevelt
Cantrell
Markham
West
Woodrow
University
Mississippi
Ringgold
Hillcrest
Pleasant Valley
Golf Course
Livestock Sanitation
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21
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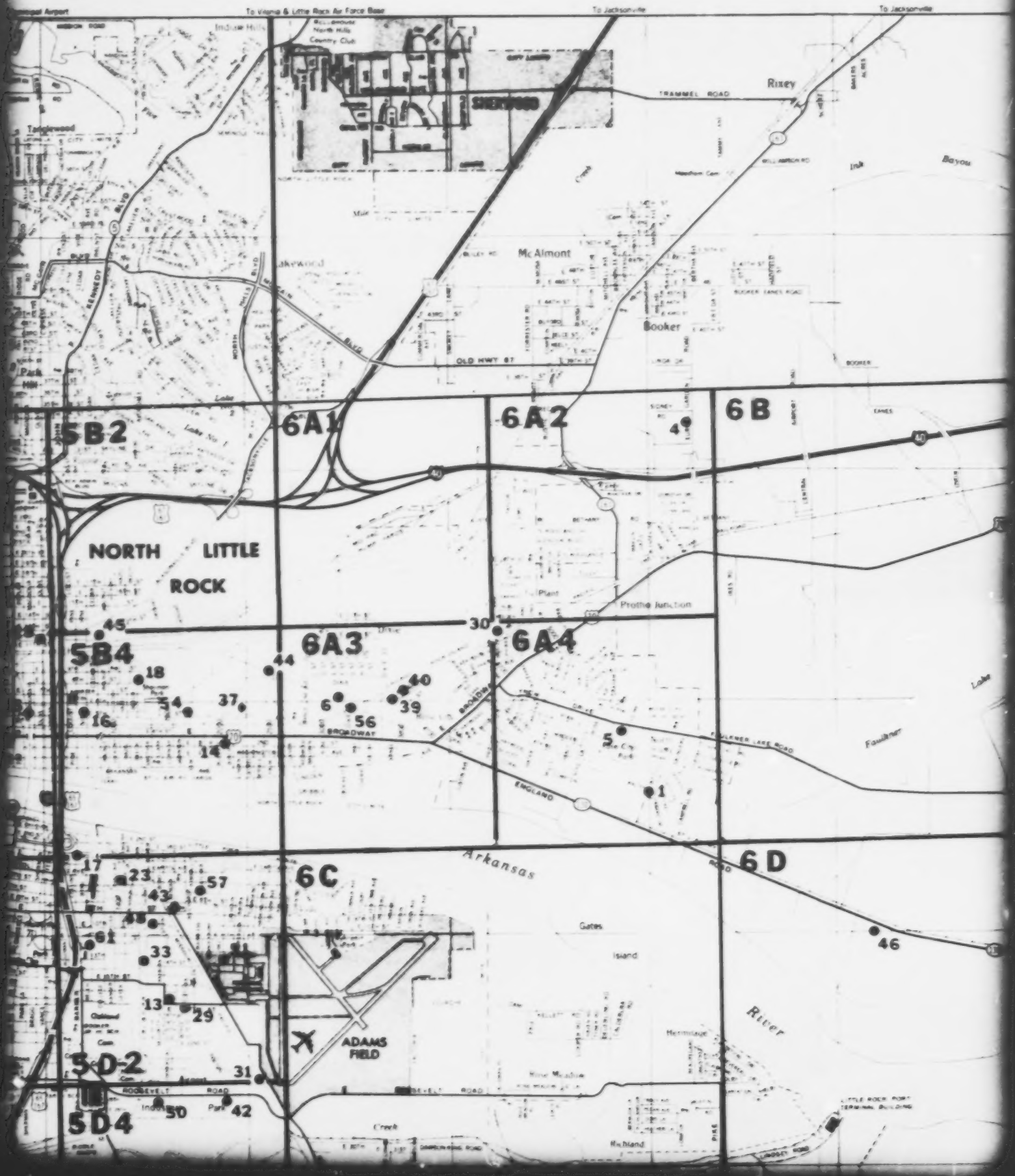
11
23


To Vilonia & Little Rock Air Force Base
To Jacksonville
To Jacksonville
Belleaire North Hills Country Club
SHERWOOD
TRAMMEL ROAD
Rixey
Bayou
McAlmont
Booker
OLD HWY 67
5B2
6A1
6A2
6B
NORTH LITTLE ROCK
Plant
Prothe Junction
5B4
6A3
6A4
BROADWAY
FAULKNER LAKE ROAD
ENGLAND
Faulkner
Arkansas
6C
6D
Gates
Island
River
ADAMS FIELD
ROOSEVELT ROAD
5D2
5D4
Richland
45
30
44
18
54
37
16
14
6
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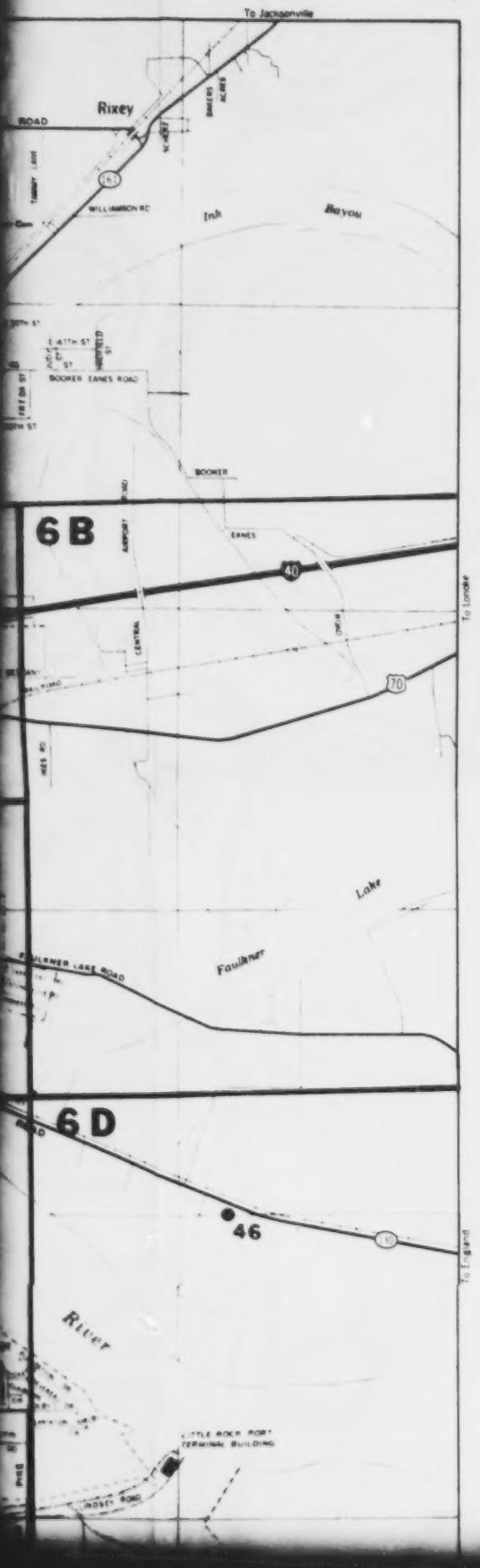
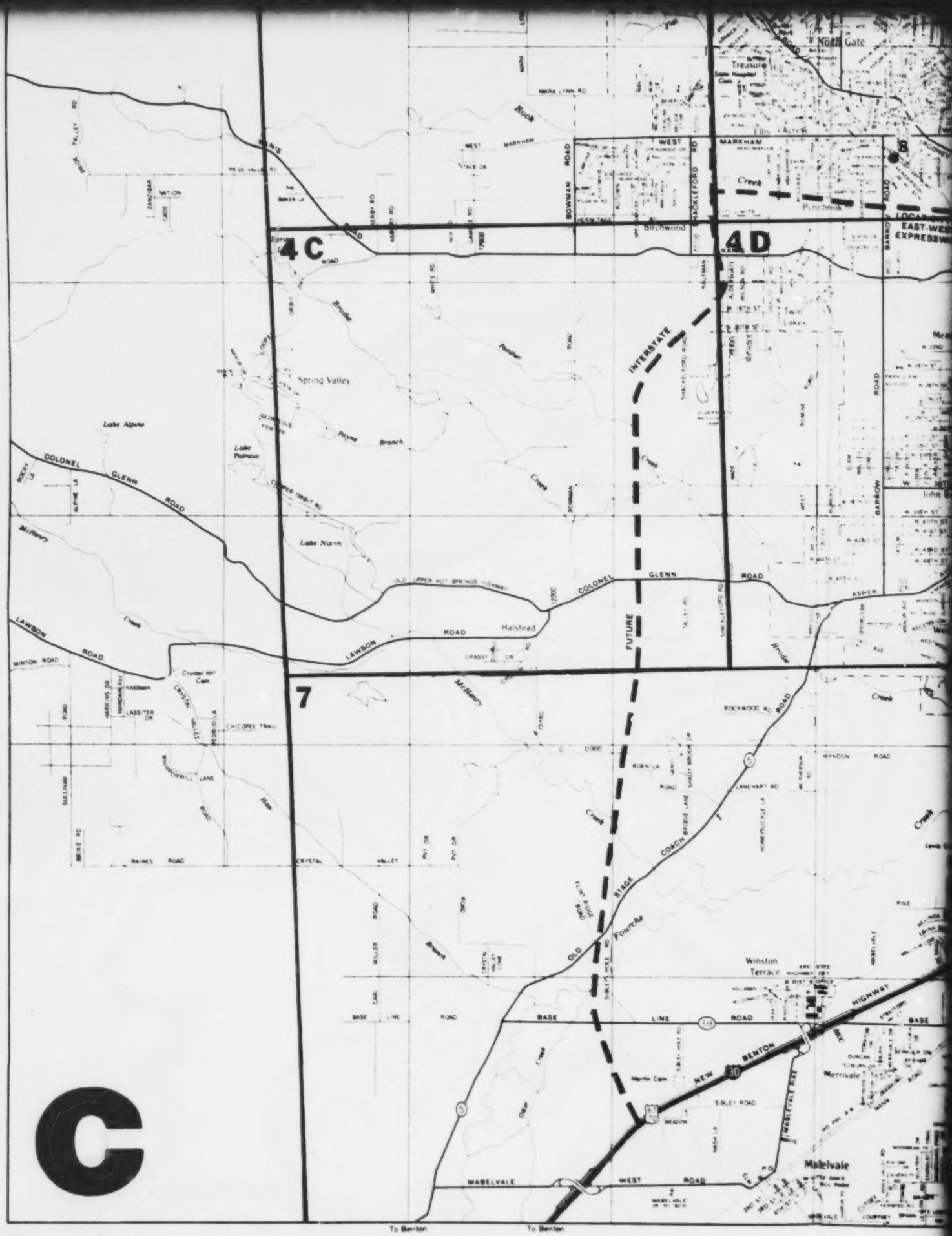
D



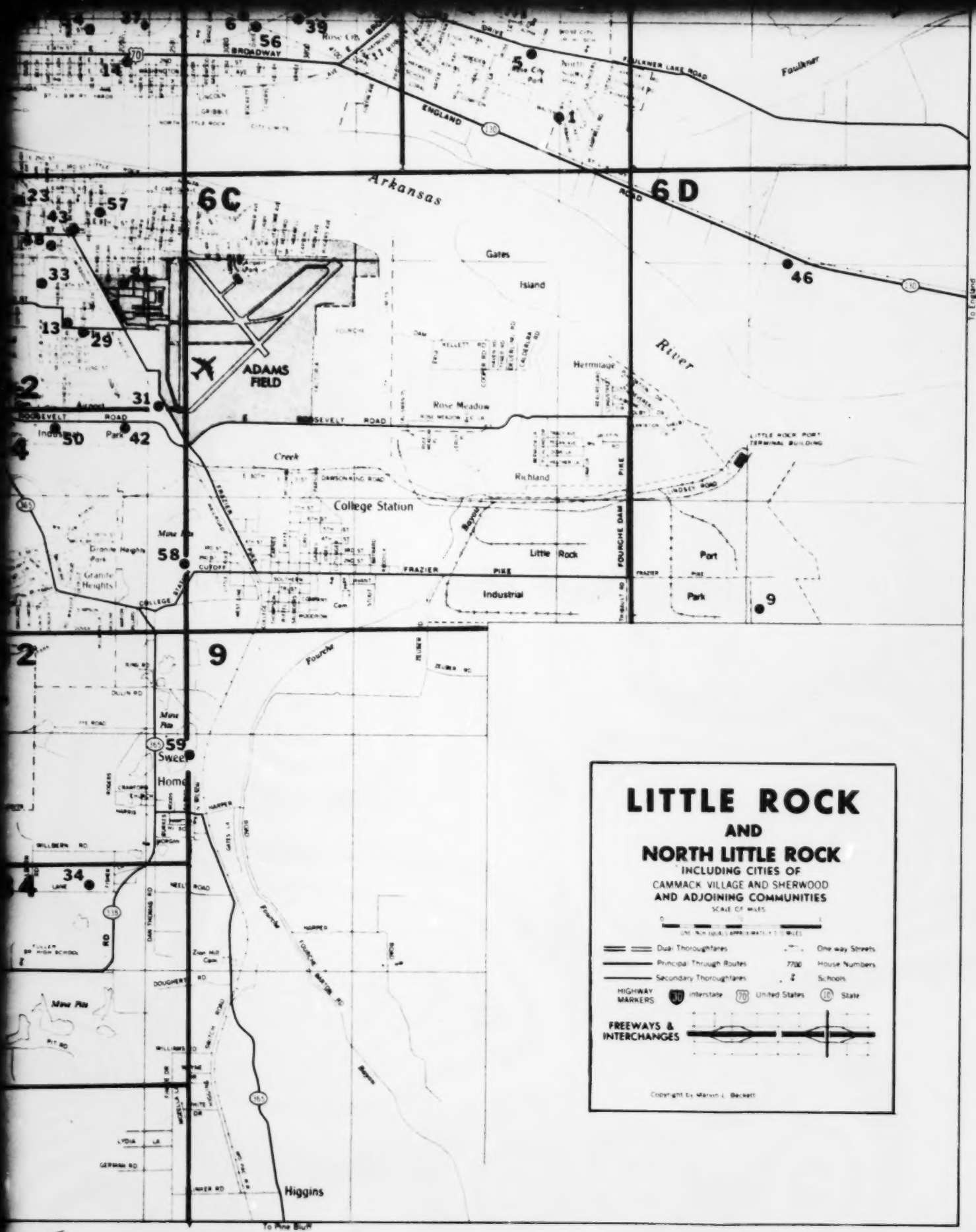
Radian Corporation

Austin, Texas

GRID	NUMBER	COMPANY NAME
6A4	1	A. E. Burrow Co.
8A1	2	AMF Cycle Division
8A2	3	A. O. Smith-Inland, Inc.
6A2	4	Apt. Construction Co.
6A4	5	Arkansas Power & Light Co.
6A3	6	Arkansas Rice Growers Coop.
8A1	7	The Armstrong Rubber Co. Special Products Div.
4B	8	Criss & Shaver, Inc.
6D	9	Little Rock, Inc.
8B3	10	Ben M. Hogan Co., Inc.
5C3	11	Ben M. Hogan Co., Inc.
8A2	12	Big Rock Stone & Material Co.
5D2	13	Bruce Furniture Dimension
5B4	14	The Buckeye Cellulose Corp.
5B3	15	Cameron Feed Mill
5B4	16	Central Mfg. Co., Inc.
5B4	17	C & F Coffee Co.
5B4	18	Chicopee Mfg. Co., Div. of Johnson & Johnson
8A3	19	City of Little Rock, Ark.
5B3	20	City of North Little Rock
5C2	21	Coffield & Moore Mfg. Co.
4D	22	Coleman Dairy, Inc.
5D2	23	Darragh Co.
5A	24	Dixie Lumber & Moulding Co., Inc.
8A1	25	Fagan Electric Co., Inc.
5C1	26	G. C. Evans Sales & Mfg. Co., Inc.
5B3	27	Hamlin Products, Inc.
5B3	28	Hardy Construction Co., Inc.
5D2	29	J. H. Hamlin & Son, Inc.
6A4	30	Koppers Co., Inc.
5D2	31	Koppers Co., Inc.
5C2	32	Leird Mfg. Co.
5D2	33	Little Rock Crate & Basket Co.
8B4	34	McGeorge Contracting Co., Inc.
5B1	35	Memorial Hospital
5C2	36	Monarch Mill & Lumber Co.
5B4	37	Olin Corp.
8A2	38	Orbit Valve Co.


4C
4D
7
INTERSTATE
FUTURE
Spring Valley
Lake Alpine
Lake Pomona
Lake Nuna
Halstead
Twin Lakes
Birchwood
Winston Terrace
Merrivale
Mabelvale
COLONEL GLENN ROAD
LAWSON ROAD
BASE LINE ROAD
MABELVALE WEST ROAD
HIGHWAY 30
NEW BENTON
To Benton
To Benton
C

5C1
5C2
5D1
5C3
5C4
5D3
5D4
LITTLE ROCK
8A1
8A2
8B1
8B2
8A3
8A4
8B3
8C
8D
N
S
E
W
Oak Forest
Meadowlark
Westwood
Cloverdale
Fairfield
Chicot Terrace
Wakefield Village
Industrial District
Gum Springs
Base Line Road
GILLAM PARK
DIXON
To Sheridan
To Pine Bluff & Sheridan


6C
6D
Arkansas
River
ADAMS FIELD
College Station
Little Rock
Industrial
Park
Richland
Hermitage
Gates
Island
Rose Meadow
Granite Heights
Fourche
Creek
Higgins
To Pine Bluff
To England
ENGLAND
FAULKNER LAKE ROAD
BROADWAY
ROOSEVELT ROAD
FRAZIER PIKE
FOURCHE DAM PIKE
LITTLE ROCK PORT TERMINAL BUILDING
Faulkner
Sweet Home
Mine Pits
Zion Hill Cem.
Rose City Park
Granite Heights Park
Indus. Park
LITTLE ROCK
AND
NORTH LITTLE ROCK
INCLUDING CITIES OF
CAMMACK VILLAGE AND SHERWOOD
AND ADJOINING COMMUNITIES
SCALE OF MILES
Dual Thoroughfares
Principal Through Routes
Secondary Thoroughfares
One way Streets
7700 House Numbers
Schools
HIGHWAY MARKERS
30 Interstate
70 United States
10 State
FREEWAYS & INTERCHANGES
Copyright by Marvin L. Beckett

F

LITTLE ROCK
AND
NORTH LITTLE ROCK
INCLUDING CITIES OF
CAMMACK VILLAGE AND SHERWOOD
AND ADJOINING COMMUNITIES

SCALE OF MILES

Dual Thoroughfares — One way Streets
Principal Through Routes — 7700 House Numbers
Secondary Thoroughfares — Schools
HIGHWAY MARKERS — Interstate — United States — State
FREEWAYS & INTERCHANGES

Copyright by Marvin L. Beckett

5B4	14	The Buckeye Cellulose Corp.
5B3	15	Cameron Feed Mill
5B4	16	Central Mfg. Co., Inc.
5B4	17	C & F Coffee Co.
5B4	18	Chicopee Mfg. Co., Div. of Johnson & Johnson
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5D2	23	Darragh Co.
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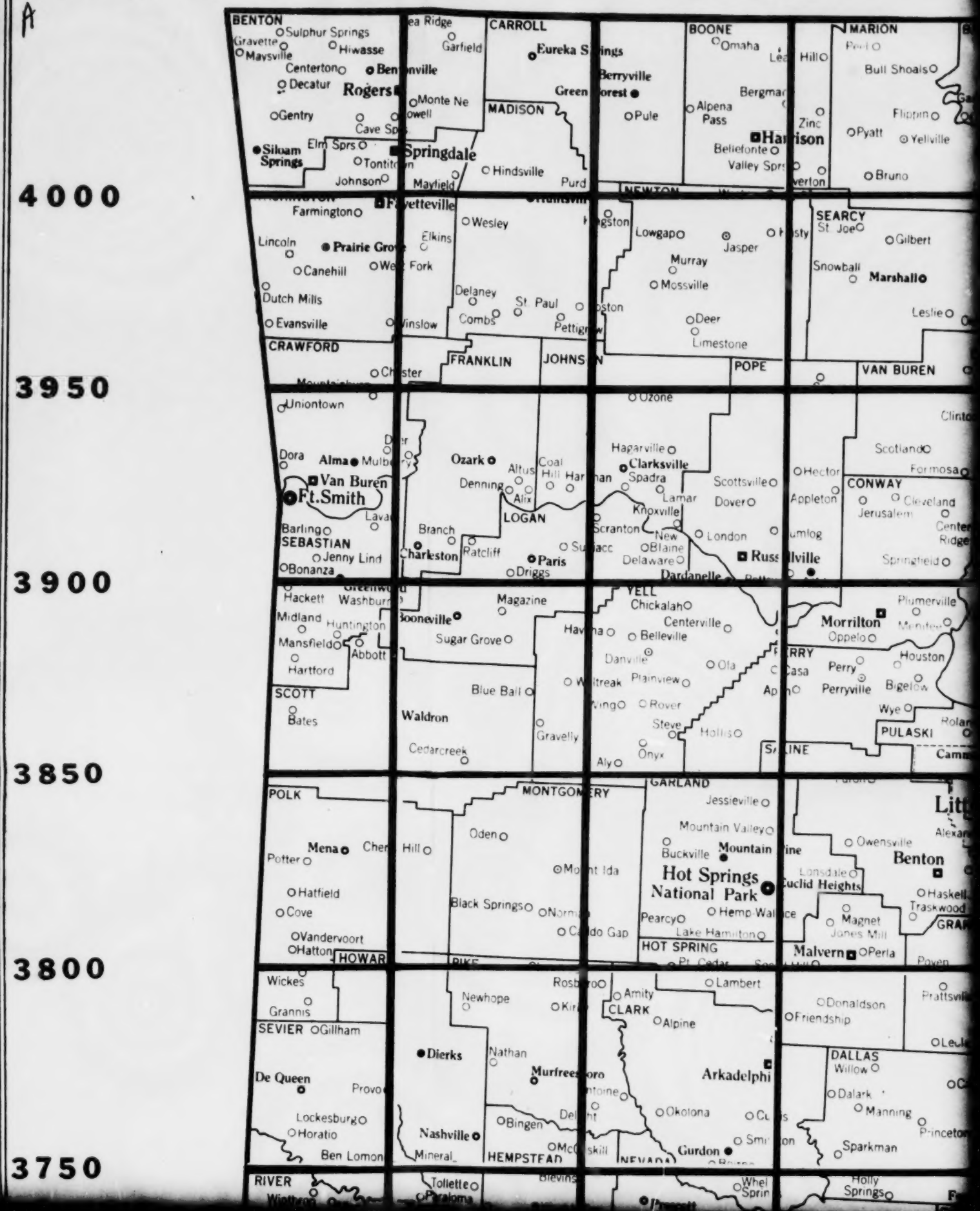
8A1	25	Fagan Electric Co., Inc.
5C1	26	G. C. Evans Sales & Mfg. Co., Inc.
5B3	27	Hamlin Products, Inc.
5B3	28	Hardy Construction Co., Inc.
5D2	29	J. H. Hamlin & Son, Inc.
6A4	30	Koppers Co., Inc.
5D2	31	Koppers Co., Inc.
5C2	32	Leird Mfg. Co.
5D2	33	Little Rock Crate & Basket Co.
8B4	34	McGeorge Contracting Co., Inc.
5B1	35	Memorial Hospital
5C2	36	Monarch Mill & Lumber Co.
5B4	37	Olin Corp.
8A2	38	Orbit Valve Co.
6A3	39	Progress Industries, Inc., Capital City Division
6A3	40	Prospect Farms, Inc.
5A	41	St. Vincent Infirmary
5D4	42	Southern Asphalt Roofing Corp.
5D2	43	Southern Cotton Oil Co., Inc.
5B4	44	Southern Farmers Association, Feed Division
5B4	45	Stauffer Chemical Co.
6D	46	Little Rock Inc.
8A3	47	Teletype Corp.
5D2	48	Thibault Milling Co.
8A2	49	Timex Corp., #2
5D4	50	Timex Corp.
5D2	51	Timex Corp.
8A2	52	Ward Supply, Division of National Steel Aluminum
5C2	53	Westinghouse Electric Corp.
5B4	54	Whitaker Mfg. Co., Inc.
8A1	55	Windsor Door Co. (Ceco Corp.)
6A3	56	W. R. Grace & Co., Construction Products Division
5D2	57	W. R. Wrape Stove Co., Inc.
5D4	58	3M Company
9	59	Milwhite Co., Inc.
7	60	Razorback Readymix Concrete Co.
5D2	61	Criss & Shaver, Inc.
5B3	62	Criss & Shaver, Inc.


A
4000
3950
3900
3850
3800
3750
BENTON
Sulphur Springs
Gravette
Hiwasse
Maysville
Centerton
Bentonville
Decatur
Rogers
Gentry
Cave Springs
Elm Springs
Siloam Springs
Springdale
Tontitown
Johnson
CARROLL
Eureka Springs
Garfield
Green Forest
MADISON
Monte Ne
Lowell
Hindsville
Mayfield
Berryville
Pule
BOONE
Omaha
Alpena
Pass
Bellefonte
Valley Springs
Harrison
MARION
Hill
Bull Shoals
Flippin
Zinc
Pyatt
Yellville
Bruno
Farmington
Fayetteville
Lincoln
Prairie Grove
Canehill
West Fork
Dutch Mills
Evansville
Wesley
Elkins
Delaney
St. Paul
Combs
Winslow
Pettigrew
Lowgap
Jasper
Murray
Mossville
Deer
Limestone
SEARCY
St. Joe
Gilbert
Snowball
Marshall
Leslie
CRAWFORD
FRANKLIN
JOHNSON
POPE
VAN BUREN
Uniontown
Dora
Alma
Mulberry
Van Buren
Ft. Smith
Barling
SEBASTIAN
Jenny Lind
Bonanza
Ozark
Altus
Coal Hill
Denning
Alix
LOGAN
Branch
Charleston
Ratcliff
Paris
Driggs
Ozone
Hagarville
Clarksville
Spadra
Lamar
Knoxville
Scranton
New Blaine
Delaware
London
Dardanelle
Russellville
Scottsville
Dover
Hector
Scotland
Formosa
Appleton
CONWAY
Cleveland
Jerusalem
Springfield
Hackett
Washburn
Midland
Huntington
Mansfield
Abbott
Hartford
SCOTT
Bates
Magazine
Booneville
Sugar Grove
Blue Ball
Waldron
Gravelly
Cedarcreek
YELL
Chickalah
Centerville
Belleville
Danville
Ola
Plainview
Rover
Steve
Hollis
Onyx
Morrilton
Oppelo
Plumerville
Perry
Perryville
Houston
Bigelow
Wye
PULASKI
POLK
Mena
Potter
Hatfield
Cove
Vandervoort
Hatton
MONTGOMERY
Oden
Hill
Black Springs
GARLAND
Jessieville
Mountain Valley
Buckville
Mountain
Hot Springs
National Park
Pearcy
Hemp
Lake Hamilton
HOT SPRING
Owensville
Benton
Lonsdale
Euclid Heights
Haskell
Traskwood
Magnet
Jones Mill
Malvern
Perla
Wickes
Grannis
SEVIER
Gillham
De Queen
Provo
Lockesburg
Horatio
Ben Lomond
Newhope
Dierks
Nathan
Murfreesboro
Nashville
Bingen
Mineral
HEMPSTEAD
Rosboro
Amity
Lambert
CLARK
Alpine
Arkadelphia
Okolona
Gurdon
Donaldson
Friendship
DALLAS
Willow
Dalark
Manning
Sparkman
Princeton
RIVER
Toliette
Paraloma
Holly Springs

FULTON
Mammoth Spring
Salem
Saddle
Hardy
Williford
Viola
Elizabeth
Henderson
Mountain Home
Norfork
Widemann
Calico
Violet Hill
SHARP
Ash Flat
RANDOLPH
Maynard
Reyno
Ravenden Spgs.
Ravenden
Pocahontas
Biggers
Okean
Black Rock
Success
Corning
McDougal
Pollard
Datto
Knobel
Boydsville
Peach Orchard
Delaplaine
Marmaduke
Beech Grove
Gainesville
Paragould
Bigflat
STONE
Mt Olive
Alco
Timbo
Flag
Hanover
Mountain View
St James
Pleasant Grove
Sidney
Strawberry
Cave City
INDEPENDENCE
Cushman
Batesville
Desha
Locust Grove
McHue
Sulphur Rock
Smithville
Hoxie
Ridge
Minturn
Sedgwick
Alicia
JACKSON
Egypt
Jonesboro
Cash
Grubbs
POINSETT
Trumann
Monette
Brookland
Black Oak
Lake City
Bay
Caraway
Blytheville
Dell
Mandalay
Victoria
Luxora
Osceola
Keiser
Oxley
CLEBURNE
Higden
Shiloh
Heber Springs
Morganton
Bee Branch
Quitman
Pleasant Plains
Hutt
Oil Trough
Olyphant
Pangburn
Bradford
Letona
Russell
Bald Knob
Searcy
Judsonia
Center Ridge
FAULKNER
Damascus
Guy
Mt Vernon
Greenbrier
WHITE
Rose Bud
Center Hill
Newport
Amagon
Weldon
Tupelo
Fisher
CROSS
Hickory Ridge
Tilton
Fairoaks
DRUFF
Augusta
Patterson
Harrisburg
Weona
Marked Tree
Tyronza
Lepanto
Parkin
Earle
CRITTENDEN
Cherry Valley
Vanndale
Gilmore
Turrell
Clarkedale
Crawfordsville
Wilson
Joiner
Dyess
Conway
Holland
Enola
El Paso
Beebe
Saltillo
Mayflower
Cato
LONOKE
Cabot
Jacksonville
Sylvan Hills
Sherwood
Village
Garner
Georgetown
Griffithville
PRAIRIE
Hickory Plains
Des Arc
Brasfield
Biscoe
De Valls Bluff
Gregory
Howell
Cotton Plant
Hunter
SAINT FRANCIS
Forrest City
Palestine
Wheatley
Brinkley
MONROE
LEE
Vincent
W. Memphis
Colt
Edmondson
Widener
Madison
Simsboro
Chatfield
Hughes
Haynes
Little Rock
N. Little Rock
Scott
Sweet Home
Genevia
Alexander
Mabelvale
Bryant
Wrightsville
Keo
Woodson
Hensley
England
Redfield
JEFFERSON
Sherrill
Carlisle
Hazen
Humnoke
Ulm
ARKANSAS
Stuttgart
Humphrey
Almyra
Clarendon
Blackton
Holly Grove
Pine City
PHILLIPS
Marvell
Turner
St. Charles
Wabash
La Grange
Lexa
Helena
West Helena
Oneida
Arsenal
Pine Bluff
West End
Pine Bluff Southeast
Noble Lake
Moscow
Tamo
Faith
Altheimer
Bayou
Grady
LINCOLN
Yorktown
Gould
DESHA
Star City
De Witt
Gillett
Snow Lake
Mellwood
CLEVELAND
Rison
Leola
Carthage
Princeton

Saddle
Hardy
Williford
SHARP
Ash Flat
RANDOLPH
Maynard
Reyno
Ravenden Spgs.
Biggers
Ravenden
Pocahontas
Okean
AWRENCE
Black Rock
Success
Corning
McDougal
Pollard
Datto
Knobel
Boydsville
Peach Orchard
Rector
EENE
Delaplaine
Marmaduke
Beech Grove
Gainesville
Shade
Pough-keepsie
Sidney
Strawberry
Cave City
INDEPENDENCE
Cushman
Sulphur Rock
Magness
Locust Grove
McHue
Smithville
Hoxie
Ridge
Minturn
Sedgwick
Alicia
JACKSON
Egypt
Jonesboro
Swifton
Cash
Tuckerman
Grubbs
POINSETT
Paragould
IGHEAD
Bono
Monette
Brookland
Black Oak
Lake City
Bay
Caraway
Trumann
SSISSIPPI
Gosnell
Hickman
Blytheville
Armorel
Dell
Tomato
Mandalay
Victoria
Luxora
Osceola
Keiser
Huff
Oil Trough
Pleasant Plains
Olyphant
Bradford
Russell
Bald Knob
Judsonia
Newport
Amagon
Weldon
Fisher
Lepanto
Harrisburg
Weona
Marked Tree
Tyronza
Oyess
Wilson
Joiner
CROSS
Hickory Ridge
Tilton
Fairoaks
DRUFF
Augusta
Patterson
Cherry Valley
Vanndale
Parkin
Earle
CRITTENDEN
Gilmore
Turrell
Clarkedale
Garner
Georgetown
Griffithville
Gregory
Howell
Cotton Plant
Hunter
SAINT FRANCIS
Forrest City
Palestine
Zent
Wheatley
Brinkley
MONROE
LEE
Colt
Edmondson
Vincent
W. Memphis
Widener
Madison
Simsboro
Chatfield
Hughes
Haynes
PRAIRIE
Hickory Plains
Des Arc
Brasfield
Biscoe
De Valls Bluff
Hazen
Ulm
ARKANSAS
Stuttgart
Almyra
Clarendon
Blackton
Roe
Holly Grove
Pine City
PHILLIPS
Marvell
Turner
St. Charles
Wabash
Elaine
La Grange
Lexa
Helena
West Helena
Oneida
De Witt
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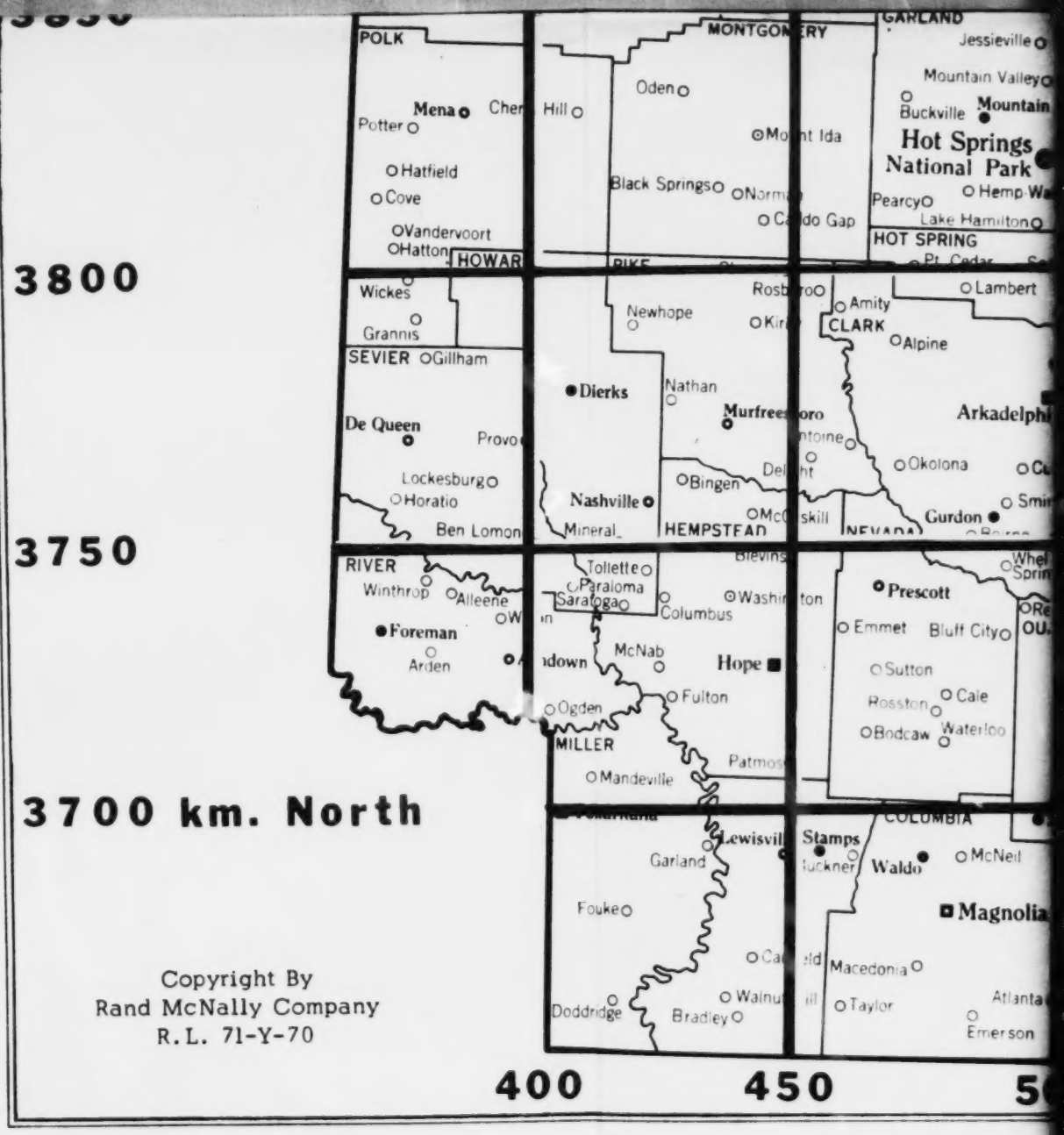
Southeast
Anrep
Grady
Yorktown
Gould
DESHA
Star City
Gillett
Melwood
Snow Lake
Watson



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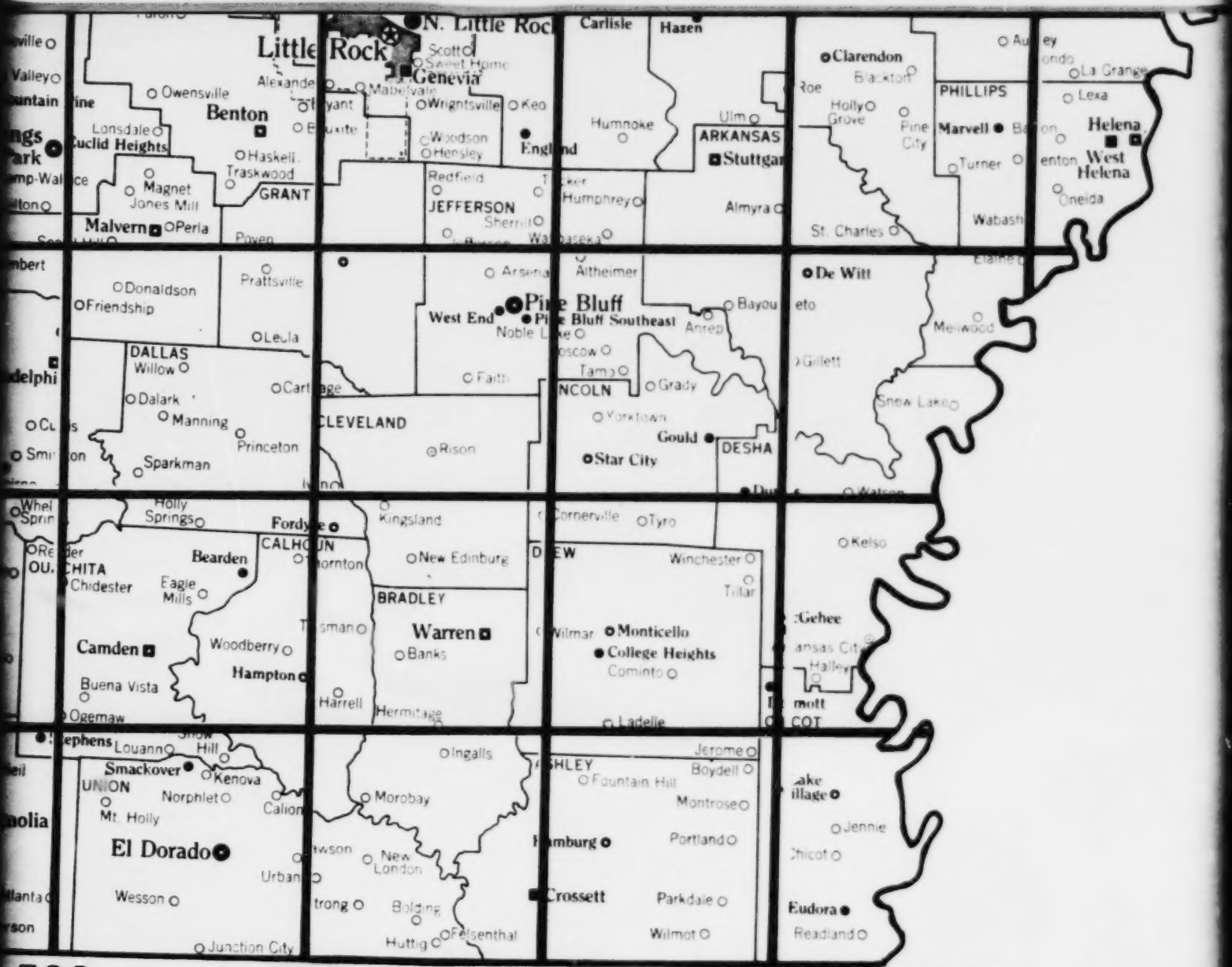
R.L. 71-Y-70


Little Rock
N. Little Rock
Scott
Sweet Home
Alexander
Owensville
Benton
Lonsdale
Euclid Heights
Haskell
Traskwood
Magnet
Jones Mill
GRANT
Malvern
Perla
Bryant
Mabelvale
Wrightsville
Keo
Woodson
Hensley
Redfield
JEFFERSON
Sherrill
Carlisle
Hazen
Humnoke
Ulm
ARKANSAS
Stuttgart
Humphrey
Almyra
Clarendon
Blackton
Roe
Holly Grove
Pine City
PHILLIPS
Marvell
Turner
St. Charles
Wabash
La Grange
Lexa
Helena
West Helena
Oneida
Donaldson
Friendship
Prattsville
Leola
DALLAS
Willow
Dalark
Manning
Princeton
Sparkman
Arsenal
Altheimer
Pine Bluff
West End
Pine Bluff Southeast
Noble Lake
Bayou
Faith
Tamo
LINCOLN
Grady
Yorktown
Gould
DESHA
Star City
CLEVELAND
Rison
De Witt
Gillett
Snow Lake
Holly Springs
Fordyce
Kingsland
Cornerville
Tyro
CALHOUN
Thornton
New Edinburg
Bearden
Chidester
Eagle Mills
BRADLEY
Warren
Banks
Harrell
Hermitage
Winchester
Tillar
Wilmar
Monticello
College Heights
Cominto
Ladelle
Kelso
Gehee
Camden
Woodberry
Hampton
Buena Vista
Ogemaw
Stephens
Louann
Smackover
Kenova
Norphlet
UNION
Mt. Holly
El Dorado
Calion
Wesson
Junction City
Ingalls
Morobay
New London
Urbana
Strong
Bolding
Huttig
Felsenthal
ASHLEY
Jerome
Boydell
Fountain Hill
Montrose
Hamburg
Portland
Crossett
Parkdale
Wilmot
Lake Village
Jennie
Eudora
Readland
500
550
600
650 km. East

Clarendon
Holly Grove
Fine City
PHILLIPS
Marvell
Turner
St. Charles
Wabash
La Grange
Lexa
Helena
West Helena
Uneida
De Witt
Gillett
Kelso
Gehee
Jennie
Eudora
Readland
ARKANSAS
Universal Transverse Mercator
grid system
Radian Corporation
Austin, Texas
a
50 km. East